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ABSTRACT

Noting that the rapid evolution of telecommunications technology, the relentless advancement of computing capabilities, and the seemingly endless proliferation of electronic data have had a profound impact on research libraries, this Systems and Procedures Exchange Center (SPEC) kit explores the extent to which these technologies have come together to form "scholarly information centers" in research libraries. A survey of Association of Research Libraries (ARL) member libraries was conducted in October 1990 to gather information about how research libraries are dealing with the impact of the "electronic revolution" on user services, from equipment and organization to funding and the role of professionals. Based on the data received from the 86 institutions that responded to the questionnaire, this report presents a summary of the survey and its findings, a copy of the questionnaire, and selected survey data. Examples of programming and policy statements, facilities descriptions, user guides, and marketing and publicity announcements are then presented. These materials, which make up the major part of the report, were contributed by the following survey respondents: University of California-San Diego; University of California-Santa Barbara; Colorado State University; Dartmouth College; University of Miami; Northwestern University; University of Pittsburgh; University of Southern California; University of Texas-Austin; Texas A&M University; and University of Western Ontario. (MAB)

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Kit 175

Scholarly Information Centers in ARL Libraries

June 1991

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SPEC
SYSTEMS AND PROCEDURES EXCHANGE CENTER

Flyer 175

Scholarly Information Centers in ARL Libraries

June 1991

INTRODUCTION

The rapid evolution of telecommunication technology, the relentless advancement of computing capabilities, and the seemingly endless proliferation of electronic data have had a profound impact on research libraries. While several related topics (e.g., telecommunications, electronic mail, end-user searching, microcomputers, microcomputer software, computerized searching, and computer files, etc.,) have been examined in previous SPEC kits, this inquiry explores the extent to which these technologies have come together to form "scholarly information centers" in research libraries.

A survey of members of the Association of Research Libraries was conducted by ARL's Office of Management Services in October 1990 to determine how research libraries are dealing with the impact of the "electronic revolution" on user services, from equipment and organization, funding, and the role of professionals. Survey responses resulted in a "snapshot" of the way research libraries are using technology to deliver services.

SURVEY RESULTS

Eighty-six ARL institutions responded to the survey. The most general summary statement that can be made is that no single model has emerged for the provision of scholarly electronic information. Many efforts are in the planning, developmental, trial, or experimental stages.

In an emerging field, it was not surprising to find few fully integrated scholarly information centers, but it was a surprise that general involvement in what might be considered newer technology was also not very widespread. For example, only 20 libraries out of 86 (24%) stated that end users have access to RLIN or EPIC. For aggregate data sets that do not have access software, only 21 libraries (24%) report that they were working with users to develop it.

Only one-third of the libraries provide dedicated public OCLC or RLIN terminals for end-user access, and even fewer train faculty for end-user searching of the utilities. If a library provides end-user accounts, it almost always also provides training. Forty-three per cent offer off-peak end-user search service, and 30% broker passwords. Mediated searches are still being performed by librarians in virtually all instances, and end-user access to databases is widely, if not yet universally, available.

Networking. The questions regarding networking revealed that several campuses do not yet have a WAN (wide area network) or telecommunications backbone to which the library can connect. Nevertheless, more than half of the libraries have their own separate LANs (local area networks), some connected to a campus network. A wide variety of LANs are in place, with microcomputers connected by LAN software predominating.

Equipment. While availability is unlikely to be uniform across the departments on a campus, almost all institutions are reporting that faculty have microcomputers in their offices for access to local or remote information sources, including a campus mainframe or supercomputer. In addition, almost all institutions have established microcomputer laboratories or centers throughout the campus.

Access to Specialized Databases and Computer Files. Access to ICPSR or census data is available in 79% of responding institutions, but only 23% of the libraries coordinate ICPSR access and 35% coordinate access to census data. Specialized databases on floppy disks or on CD-ROMs are almost always funded and made available by the library. Approximately 73% of responding institutions indicated they provide nonbibliographic databases on CD-ROMs. About half of the responding institutions are making locally developed computer files available for searching.

The storage medium largely influences whether the library or another unit on campus pays for, houses, and provides user services for databases and computer files. In 19% of the responses, the library houses magnetic tapes and 71% house microcomputer (floppy or hard disk) files. CD-ROMs are primarily funded by, housed in, and serviced by the library. Data on magnetic tape or in files on the mainframe and aggregate data sets that do not have access software are primarily the responsibility of the computer center. There is no predominant pattern for the provision of specialized databases or microcomputer files on floppy or hard disks.

ASSOCIATION OF RESEARCH LIBRARIES OFFICE OF MANAGEMENT SERVICES

Setting Information Policy. Several survey responses offered long, thoughtful, and detailed replies to the questions regarding policy-setting roles of information organizations on campus and of the service roles of information professionals. Although there are few institutions with official policies, there is a fairly clear understanding of who is doing what.

Schools and colleges are not seen as influential in setting information policy and are generally regarded as users of scholarly information. They often operate labs or other means of accessing networked information. Some schools have hired professional information experts to help students and faculty with computer use. Several have invested in their own CD-ROMs.

Role of Library and Computing Center. The library and the computing center are the principal players in the provision of scholarly electronic information, with statistical/data labs a distant third. Such labs are sometimes operated by the computer center.

In a majority of cases, the library is responsible for selection of information resources, including databases, for training in the use of such resources, and for searching assistance. Many libraries are also responsible for technical assistance, but the survey indicates that few libraries have distinguished between the type of technical assistance offered by the library and that offered by the computer center. Some libraries specifically mentioned publicity for information resources as a library activity. A few libraries still define their scope in terms of printed or bibliographic information, but most take responsibility for acquisition of and access to information resources in all formats, including electronic formats. One library defined its role as limited primarily to text in any format, as compared with statistical files on tape.

Quite a few libraries state that the library is taking the lead in providing scholarly information in electronic format; more say the provision of scholarly information is collaborative across campus, and especially between the library and computer center.

Several show a strong role played by the statistics lab or data lab. One library reported that it focuses on the content and use of information, while the computer center focuses on technical training and assistance.

By and large, computer centers are regarded by libraries as having limited responsibility for electronic information. Usually computer centers provide technical support and some training, usually for software use and for management of files mounted on mainframes. Often computer centers are responsible for communications and networking on campus.

Computer centers do offer consultation services, but several surveys pointed out that there is a fee for computer center services, whereas libraries teach, consult, and offer technical assistance as part of their mission without a fee. In general, libraries purchase or provide data files selected by librarians; computer centers are not responsible for selection of computer-based resources, but instead manage whatever is provided them by faculty or librarians. They are often responsible for selection of hardware and key areas of software that they support. Computer centers are not generally regarded as being particularly proactive in support of academic information issues. At one institution, the computer center is responsible for instruction and searching assistance for online and tape databases. This is unusual, except where the computer center offers a statistics lab or center for dataset use.

A statistics or data lab occasionally plays a major role, especially in helping with access software, training for data analysis, etc. It is not usually mentioned as a major player, possibly because only the larger universities have a separate data lab that is available to all segments of the university. Sometimes a statistics lab is operated by one of the schools or colleges and makes services available for a fee to others. A couple of universities say the lab is attached to academic computing or to the computer center.

Faculty teach use of computers to students in their disciplines, integrating information technology into the curriculum and into their research. Faculty are usually regarded by the library as "users" who create demands and offer problems for the library or computer center to solve.

ISSUES AND TRENDS

Research libraries have always been "scholarly information centers." In the emerging electronic university, with the growth of independent departmental computing capabilities separate from central computing facilities and services as well as easy, direct access to a variety of databases, the concept of the research library has expanded beyond the physical library. The research library, consisting of a series of collections with variable levels of access, is broadening, and terms such as "scholarly workstation," "scholarly information centers," and "academic integrated information services" represent the blend of services provided by research libraries and computer centers.

End-user computing--including downloading online catalog search results and other resource files, and document delivery facilitated by the library or other source agencies--will continue to raise questions concerning the issue of centralization of library services, as well as about potential roles of the library in such activities as computing, networking, training, data creation and distribution, and in providing direct or mediated access to data, either bibliographic or nonbibliographic.

This kit and flyer was compiled by Nancy Allen, Assistant Director of Public Services, Joan Chambers, Director of Libraries, and Irene Godden, Associate Director, Colorado State University Libraries. This kit was prepared as part of the OMS Collaborative Research/Writing Program.

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SPEC Kits (ISSN 0160 3582) are available mainly by subscription. Individual issues may be purchased from the Office of Management Services, 1527 New Hampshire Ave., NW, Washington, DC 20036. Pre-payment is required. (ARL members may be billed.) Payment must accompany order. Price includes library rate postage if shipped in the United States. If you would like your order shipped UPS, please add $5.00 per issue. All orders to Canada must add $5.00 per issue for shipping and handling. All shipments to countries other than the United States and Canada must add $8.50 per issue for shipping and handling.

SPEC
SYSTEMS AND PROCEDURES EXCHANGE CENTER

Kit 175

Scholarly Information Centers in ARL Libraries

June 1991

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SURVEY RESULTS

ASSOCIATION OF RESEARCH LIBRARIES
OFFICE OF MANAGEMENT SERVICES
1527 New Hampshire Avenue, N.W., Washington, D.C. 20036
202-232-8656 FAX 202-462-7849

TO: SPEC Liaisons

FROM: C. Brigid Welch, Program Officer for Information Services
Irene Godden, Colorado State University

DATE: 29 October 1990

SUBJECT: SPEC Survey on Scholarly Information Centers

In the emerging electronic university, with the growth of independent departmental computing capabilities separate from central computing facilities and services, as well as easy, direct faculty access to a variety of databases, the concept of a research library has expanded beyond the physical library. The concept of a research library consisting of a series of collections with variable levels of access is broadening to encompass "the scholarly work station," "scholarly information centers," and "academic integrated information services," often representing a blend of services provided by research libraries and computer centers.

End-user computing—including down-loading online catalog search results and other resource files, and document delivery facilitated by the library or other source agencies—has not only made moot the issue of centralization of library services, but has raised many questions about potential roles of the library in such activities as computing, networking, training, data creation and distribution, as well as in providing direct or mediated access to data, either bibliographic or full-text.

This SPEC survey is designed to explore how ARL libraries are dealing with the specifics of the "electronic revolution," from equipment and user services to organization, funding, and the roles of professionals. Beyond answers to the questions below, we are particularly interested in documentation, such as committee or administrative reports and organization charts. Please explain, qualify, or augment your answers as needed.

The completed survey along with supporting documentation should be returned by **December 7, 1990** to:

Irene Godden, Associate Director
Colorado State University
Fort Collins, Colorado 80523
Telephone: (303) 226-1344

SPEC SURVEY - SCHOLARLY INFORMATION CENTERS

Library/Institution: ____________________

Contact Person: ____________________

Title: ____________________ Telephone: ____________________

A. NETWORKING

1. Please enclose a "map" which shows how the library is connected to your campus telecommunication configuration. If you do not have such a map, please describe on the back of this sheet.

2. Is there a separate library LAN (local area network)?

_____ Yes. If yes, please go to **question 3**. _____No. If no, please go to **question 4**.

3. Please indicate the LAN used:

_______Vax
_______IBM or other minicomputer
_______Microcomputers and LAN software (such as Novell, BV, etc.)
_______other (please describe):

4. Does the library provide dedicated public OCLC or RLIN workstations for end user access?

_______Yes. If yes, how many in each location? No_______
    _______ main library building
    _______ branch libraries
    _______ locations outside library space

5. Does the library train users for end-user access to RLIN or EPIC?

_______Yes _______No

6. Do faculty have RLIN or OCLC end-user accounts which are used from terminals or minicomputers outside the library?

_______Yes _______No

7. Please indicate how modem-based access to database services (i.e., BRS, Dialog, Lexis, Westlaw, Medline) is offered. Check all that apply.

_______librarian-performed searches from library minicomputers
_______off-peak end-user search services (i.e., BRS After-Dark, or Knowledge Index)
_______brokered passwords for end user searching to be done outside the library in departments, schools, and colleges
_______user searches done without the involvement of the library
_______other (please describe):

If more than one of these are checked, please provide additional information on the relative use of each option as well as any available documents.

B. EQUIPMENT

Please indicate below workstations for access to scholarly information (local electronic mail, Internet access, dial access to off-campus resources, access to local library resources, etc.) available to faculty.

	Yes	No
1. Microcomputers in faculty office for individual faculty use	_______	_______
2. Workstations in laboratories or centers	_______	_______
3. Mainframes or supercomputers for faculty use	_______	_______

4. Other. Please describe and/or enclose available documents.

C. ACCESS TO SPECIALIZED DATABASES AND COMPUTER FILES

1. Please indicate if there is access to and use of each type of computer file on your campus.

	Yes	No
a. ICPSR (Intercollegiate Consortium for Political and Social Research)	______	______
If yes, does the library coordinate membership?	______	______
b. U.S. Census or other national demographic data (e.g., CANSIM)	______	______
If yes, does the library coordinate access?	______	______
c. Commercially available nonbibliographic databases on floppy disk or CD-ROM (e.g., Medieval and Early Modern Databank or Compact Disclosure)	______	______
If yes, does the library fund?	______	______
Does the library provide access?	______	______
d. Locally developed computer files available for searching	______	______

e. Other (please describe):

2. Please indicate responsibility for managing each type of data format. (Check all that apply.)

a. CD-ROMS
______housed in library
______housed outside library
______funded by library
______library provides user services
______schools/colleges provide user services
______other (describe on the back of this sheet)

c. Magnetic tapes
______housed in library
______housed outside library
______funded by library
______library provides user services
______computer center provides user services
______statistical/data lab provides user services
______other (describe on the back of this sheet)

e. Specialized databases (**Please provide list**)
______housed in library
______housed outside library
______funded by library
______library provides user services
______ computer center provides user services
______ statistical/data lab provides user services
______ other (describe on the back of this sheet)

b. Floppy or hard disks (microcomputer files)
______ housed in library
______ housed outside library
______ funded by library
______ library provides user services
______ schools/colleges provide user services
______ other (describe on the back of this sheet)

b. Mainframe files
______ housed in library
______ housed outside library
______ funded by library
______ library provides user services
______ computer center provides user services
______ statistical/data lab provides user services
______ other (describe on the back of this sheet)

3. For aggregate data sets that do not have access software, which unit works with users to create access? Please check all that apply.

______library
______media center
______other (please describe):

______ Computer center
______ statistical/data lab
______ none

D. ORGANIZATIONAL ROLES

What policy roles to the following play in provision of scholarly information? For each category below, please provide a brief response, indicating who has major responsibility for each area, e.g., technical assistance, searching assistance, instruction/training, etc. Use the back of this sheet if necessary. **Please attach any available documentation**.

1. Library

2. Computer Center

3. Media Center

4. Statistical/Data Laboratory

5. Schools/Colleges

E. ROLES OF INFORMATION PROFESSIONALS

In planning for the provision of scholarly information services, what roles seem to be emerging on your campus for the following groups? Please provide a brief response; use the back of this sheet if necessary. **Please attach any available documentation**.

1. Librarians

2. Teaching Faculty

3. Computer Experts

Return this survey form, with supporting documents by **December 7, 1990** to:

Irene Godden, Associate Director
Colorado State University Library
Fort Collins, Colorado 80523

Summary table of selected responses

Library/Institution: 86, including Colorado State University

A. NETWORKING
21 descriptions, 38 maps, 23 no response

1. Is there a separate library LAN (local area network)?

50 yes.

35 no. Some of these use campus net rather than having a separate LAN.

Some of these use campus net rather than having a separate LAN.

2. Please indicate the LAN used:

5 Vax
4 IBM or other minicomputer
34 Microcomputers and LAN software (such as Novell, BV, etc.)
16 other (please describe):

3. Does the library provide dedicated public OCLC or RLIN workstations for end user access?

28 Yes. If yes, how many in each location?
  44 main library building
  6 branch libraries
  4 locations outside library space

57 No.

NYU = Ungerman-Bass Baseband
NC State, UT Austin = Appletalk
West Ont = experimental unix w/sun workstation as server
UW = Lantastic
BU = Localtalk
Notre Dame = Lantastic for LDS
NYPL = AT&T Voice & Data Network

4. Does the library train users for end-user access to RLIN or EPIC?

20 Yes

66 No

5. Do faculty have RLIN or OCLC end-user accounts which are used from terminals or minicomputers outside the library?

20 Yes

61 No

4 Don't know

6. Please indicate how modem-based access to database services (i.e., BRS, Dialog, Lexis, Westlaw, Medline) is offered. Check all that apply.

84 librarian-performed searches from library minicomputers
37 off-peak end-user search services (i.e., BRL After-Dark, or Knowledge Index)

26 brokered passwords for end-user searching to be done outside the library in departments, schools, and colleges
43 user searches done without the involvement of the library
9 other (please describe):

*USC has 14 databases on local system
*NWestern has Medline in Medlibrary
*Berkeley has Dow Jones & CAS in departmental libraries
*WSU has lexis in law library, CAS in S/T
*Purdue has Dow Jones
*UCLA has databases in Orion
*AZ has CAS
*Queens permits searching on library codes & then bills for time
*UGa is mostly mediated, CAS in Chem
*Ohio State provides statistics
*ULSD has UC Medline & currcont via Melvyl
*Oregon has CAS
*CanInst of S/T Info has a list
*Case West has Lexis on campus net
*UIUC has databases via BRS software
*Ariz has public service stats

If more than one of these are checked, please provide additional information on the relative use of each option as well as any available documents.

B. EQUIPMENT

Please indicate below workstations for access to scholarly information (local electronic mail, Internet access, dial access to off-campus resources, access to local library resources, etc.) available to faculty.

		Yes	No
1.	Microcomputers in faculty office for individual faculty use	78	4
2.	Workstations in laboratories or centers	75	6
3.	Mainframes or supercomputers for faculty use	77	4
4.	Other. Please describe and/or enclose available documents.	4	

Some of these said no, thinking we meant Library faculty, others were special libraries like Linda Hall, NYPL.

C. ACCESS TO SPECIALIZED DATABASES AND COMPUTER FILES

1. Please indicate if there is access to and use of each type of computer file on your campus.

		Yes	No
a.	ICPSR (Intercollegiate Consortium for Political & Social Research)	63	20
	If yes, does the library coordinate membership?	20	44
b.	U.S. Census or other national demographic data (e.g., CANSIM)	68	16
	If yes, does the library coordinate access?	30	36
c.	Commercially available nonbibliographic databases on floppy disk or CD-ROM (e.g., Medieval and Early Modern Databank or Compact Disclosure)	63	19
	If yes, does the library fund?	62	19
	Does the library provide access?	58	12
d.	Locally developed computer files available for searching	44	27

e. Other (please describe): 13

*Chicago OPAC as yes
*Purdue: Current contents, IMF tapes
*Laval lists CDs

*OSU, Dartmouth, UBC, internet OPACS
*Alberta: brochures
*Houston: Index Export

*CU, ASU: CARL +
*UT Austin: several campus info files

*York: JSR, Educ. DB
*UCSD: GPO files, incl. remote access & downloading
*UCSB attached list
*MIT: Tech Info
*Kent: Campustate & 3 business files

*UW: locally developed files

2. Please indicate responsibility for managing each type of data format. (Check all that apply).

a. CD-ROMS

85 housed in library
34 housed outside library
77 funded by library
73 library provides user services
23 school/college provide user service
3 other (describe on back)

b. Floppy or hard disks (microcomputer files)

61 housed in library
40 housed outside library
49 funded by library
47 library provides user services
31 school/college provide user serv.
3 other (describe on back)

c. Magnetic tapes
16 housed in library
72 housed outside library
42 funded by library
29 library provides user services
68 computer center provides user serv.
32 stat/data lab provides user serv
4 other

d. Mainframe files
4 housed in library
68 housed outside library
34 funded by library
37 library provides user services
58 computer cntr provides user serv
21 stat/data lab provides user serv
1 other

e. Specialized databases
16 housed in library
33 housed outside library
28 funded by library
27 library provides user services
25 computer center provides user services
13 statistical/data lab provides user services
2 other

3. For aggregate data sets that do not have access software, which unit works with users to create access? Please check all that apply.

21 library
1 media center
61 computer center
28 statistical/data lab
3 none
2 other

SYSTEMS AND PROCEDURES EXCHANGE CENTER

PROGRAMMING AND POLICY STATEMENTS

ASSOCIATION OF RESEARCH LIBRARIES OFFICE OF MANAGEMENT SERVICES

University of California, San Diego
June 27, 1990

COMMITTEE ON LONG-RANGE PLANNING FOR ACADEMIC SUPPORT SERVICES

REPORT AND RECOMMENDATIONS

Executive Summary

INTRODUCTION

The Committee on Long-Range Academic Support Planning was charged to draw guidelines for the development of academic support services on the new campuses the University of California plans to open between 1998 and 2000. The components of the support services were defined as the library, academic computing, and educational technology, and the task of the committee was to provide the future faculties and administrations of the new campuses with guidance for their development.

The committee approaches the subject of its report from the point of view of the users, faculty and students. By the year 2000, faculty and students will see a **single system image** of the academic support services. To members of the academic community, information about the library's collections, computing resources on and off campus, and a variety of educational technologies will appear to be parts of a unified system of academic support accessible from workstations on and off campus.

In establishing the academic support system the founders of the new campuses should aim to create a single system image or environment based on an electronic network. The system of academic support services should unify the community by giving it an electronic as well as a physical environment. The system will not replace the social community of the campus, but it will enhance that community, while giving it increased access to other colonies of faculty and students around the world. In these ways, it should increase the University's ability to educate students and to contribute to the civilization's knowledge and understanding.

The committee recommends:

1. A Single System Image: The Electronic Network

- o The academic support services of the new campuses should be developed within a single system image based on an electronic network that extends broad highways throughout the campus and connects to regional, national, and international networks. Faculty, students, and staff should gain access to the components of the academic support system through the network as well as by going to their physical locations.
- o In the physical and capital planning of the new campuses, provision should be made for the network; the campus and its buildings should be designed to accommodate future developments in the technology.
- o The campuses should establish central administrative offices to manage their networks and to impose communications standards.
- o The University should establish a budget for network operations sufficient to keep the network up to date.

2. The Components of the Academic Support System

a. *The Library*

- o The opening-day libraries of the new campuses should be fully automated segments of the University of California Library under the *University of California Plan for Libraries* (1977). They should develop collections of books, journals, and other materials based on the academic plan of the particular campuses. To ensure that library supports its academic programs, a new campus should appoint the librarian very early in its development.
- o While existing models and formulae for funding collection development, staffing, and library space will determine the growth of the new libraries, the design of the new libraries must take into

academic environment on campus by giving members of the community access to one another. Electronic mail, the transferring and sharing of data files, and other tools of the network will constitute a new medium through which faculty and students interact in carrying out their academic functions.

The new campus administrations must lay the foundations of this system long before concrete is poured. In planning the first campus buildings, they must ensure that the implements necessary for the creation of a campus network of sufficient capacity are included in the basic design of the facilities.

BUILDING THE ACADEMIC SUPPORT SYSTEMS FOR NEW CAMPUSES

Today, the academic community lives in an environment made up of buildings, the utility system, and the walkways, coffee houses, and open spaces of the campus. The avenues of interaction between the campus and outside world are also part of the academic environment. The academic support services--the library, computing system, and instructional technology--are tools to be used within this complex ecosystem. Each has its place on campus. One goes to the library and the media center for research and rents equipment from audio-visual services for teaching. Already, faculty and students have ceased going to the computing center because they have in their offices and remote computing laboratories machines that provide many of the functions once provided only at the central site and because they can gain access to the specialized computers housed there through an electronic network. Even as the committee deliberates, the libraries are also coming on line. The process by which the electronic communication system is branching out through the campus communities reminds one of the progress of rural electrification during the 1930s.

In the future, the three components of the academic support system will be fully integrated into an enhanced campus environment based on the electronic network. The network will be a medium of intellectual exchange and education, taking its place along side the classrooms, laboratories, and other spaces of the campus, formal and informal. Now, the campus is a physical complex where faculty and students accomplish their missions; in the future, this complex will be enhanced by the installation of an electronic environment. The system for supporting the academic mission of the university will have changed from a toolkit to a virtual ecosystem within which the faculty and students achieve their academic goals.

How will the traditional components of the academic support system contribute to and fit into this new environment? Logically, we should begin with the backbone of the system, the electronic network, but, historically, the three traditional components--library, academic computing, educational technology--have priority. To present a clear picture of the integrated system's structure, our report will follow the historical order, describing the components of the system one by one, ending with the electronic network. We will delineate the technological and, more important, the functional characteristics of these components of the existing academic support system as a basis for creating a vision of the future system. In setting out our recommendations about that system, we shall follow the logical order of description, starting with the electronic network, which will give access to the other components.

1. The Library

The libraries of the new campuses will be founded on the principles enunciated in the 1977 *University of California Plan for Libraries*, especially the idea that, just as the University is a single entity composed of the campuses and other academic and research units, so its library is one collection composed of the campus and institute libraries. MELVYL®, the on-line union catalog of the University libraries, is the foundation on which University is constructing a unified Library under the concept of "one University, one Library. The new campus libraries will join this system, and the communities of the new campuses will be able to use the resources of the whole library.

Nonetheless, in the thirteen years since the University completed its Library Plan library functions and collections have changed in many ways. Since then, the University has built an electronic network, which is the backbone of the MELVYL catalog, and has made electronic databases available through

COMMITTEE ON LONG-RANGE PLANNING FOR ACADEMIC SUPPORT SERVICES

REPORT AND RECOMMENDATIONS

INTRODUCTION

The Committee on Long-Range Academic Support Planning was charged to draw guidelines for the development of academic support services on the new campuses the University of California plans to open between 1998 and 2000. The components of the support services were defined as the library, academic computing, and educational technology; the task of the committee was not to describe these functions in detail, but to provide the future faculties and administrations of the new campuses with guidance for developing these three essential services. The founders of the new campuses will have to create the institutional structures within which these functions exist, to allocate resources, and to schedule development to be ready for the first students. The committee was charged with mapping the territory of academic support services, spelling out the issues the founders should deal with, and giving advice about how the institution might best meet its need for the services.

In thinking about its audience, the committee recognized that although the new campuses will not open at the end of the century, the first decisions about the functional characteristics, structure, and financing of their academic support services must be made during the next five years. This is a lucky circumstance because during its discussions, the committee found that it could not with any certainty describe what the technological environment will be like 10 to 15 years from now. Our advice concerns the use of technology that has already come into view. Another way of putting this point is that the administrations of the new campuses are among us; we are advising our academic and administrative colleagues.

At its first meeting in December 1989, the committee created a process for completing its work. The first stage was to commission three working papers, one for each of the three components of the academic support system. At the second meeting in February 1990, the committee discussed these papers. In late March, it sponsored an Advanced Technology Seminar where speakers invited from across the country presented ideas about the future of university libraries, academic computing, and instructional technology. After the seminar, the committee began work on its report and recommendations.

THE PERSPECTIVE OF THE USERS

The committee approaches the subject of its report from the point of view of the users, faculty and students. All of the technology and systems described in this report will greatly benefit those who provide services--the librarians who build and maintain the collections, the programmers and other specialists who develop the computing and network operations, the technical staff who help faculty and students use the new technologies in classrooms and elsewhere on campus--but the committee will not discuss these benefits. It is only interested in "end-users," the members of the academic community who use the services to teach and learn.

By the year 2000, faculty and students will see a **single system image** of the academic support services.[1] The image will be created by the electronic network, which will give access to all elements of the support system. To members of the academic community, information about the library's collections, computing resources on and off campus, and a variety of educational technologies will appear to be parts of a unified system of academic support accessible through the workstation in offices, dorm rooms, and various public locations on campus. Even more important, the network will become the medium of a new account the new sources of information and new technologies for storing and using the record of a library's holdings.

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[1] On the idea of a single system, see Robert Heterick, Jr., *A Single System Image: An Information Systems Strategy*, Professional Paper Series, 1, CAUSE, The Professional Association for Computing and Information Technology in Higher Education, 1988.

- The strength of the new libraries should be measured by the access they give to printed, visual, and electronic materials. Library planners should provide for the maximum possible access to materials from other UC collections and for delivery of electronic sources of information. This will require action on existing campuses to make their collections accessible to the new campus libraries.
- Information about library collections should be accessible through the electronic network.
- The new libraries should establish document delivery systems to serve their campus communities.

b. *Academic Computing*

- The new campuses should establish academic computing systems that are as open and flexible as possible. The academic computing system should have the potential to include all instructional and research computing facilities on campus unified by the electronic network. Nonetheless, the computing system will be composed of centrally administered and independent units. Decisions about computing will focus on the institutional and budgetary issues raised when departments and research groups want to build their own computing facilities. The committee believes that decisions to permit such groups to go it alone should rest on the academic plan of the campus, not on principles of organization.
- The campuses should establish policies for operation of the central facilities, for staffing instructional and research computing facilities throughout the campus, and for managing the academic computing system as a whole.
- The academic computing systems should be budgeted under formulae, similar to the existing formula for instructional use of computers. The establishment of a comprehensive computing budget is necessary if the computing system is to provide support for the academic programs of the twenty-first century. The academic computing budget should take into account student enrollment, the number of faculty, and the nature of campus academic programs. In parallel to other aspects of the University's program of research, the computing budget should support the use of computers in research. Faculty can be expected to continue to obtain extramural grants for computing, but the University should establish a base level of research computing. The budget for research computing should take into account the number of post-doctoral students and research staff.

c. *Educational Technology*

- The committee recommends that the new campuses coordinate instructional development with academic computing (particularly instructional use of computing) to assist faculty to incorporate the elements of educational technology into the curriculum.
- The campus programs that provide consultation and machines for instructional technology should be budgeted under formulae that take into account student enrollment, faculty FTE, and the nature of campus academic programs. The functions and budgets of existing audio-visual services and media facilities should be incorporated in the new comprehensive budget for instructional technology.
- The most important element in instructional technology services will be the size and quality of the staff. Staff members must have knowledge of the various academic disciplines they serve--much like subject bibliographers in the library. They must have credibility on with faculty and students because one of their tasks will be to encourage the innovative use of technology.
- Instructional technology services should be offered both through the electronic network and in various campus locations. Consequently, the University should develop space standards to ensure that campuses have adequate and well-designed space for instructional technology service organizations.

MELVYL. Campus libraries have developed their own automation systems tied to local area networks, added electronic sources of information to their collections, developed document delivery systems, and experimented with new forms of interlibrary loan and with print-on-demand services for users. All of these developments create an environment for the creation of the new campus libraries that is significantly different from the one in which older libraries developed.

When the University founded new campuses at San Diego, Irvine, and Santa Cruz in the early 1960s, the planning for the new libraries concentrated on the size and composition of the opening-day collections. The library consisted of books, journals, manuscripts, maps, and other visual materials (although few libraries made a special effort to collect and catalog the last). In those days, the proper way to talk about the libraries for the new campuses was to speak of the number of volumes the different academic disciplines would need on opening day. Planners defined the base collection as 75,000 volumes.

a. *The Automation of the Catalog*

It was not long after the foundation of the new campuses that the nature of the library began to change. The first change was in the way one gained access to information about the collection. In the libraries of the 1960s, the card catalog, housed in a catalog room (and often spilling out into corridors and reading rooms), was the point of entry to the collection. Today, the card catalog is disappearing, replaced by computer terminals that connect one to an on-line catalog. At first, during the early 1980s, this change of the catalog's format did not affect the role of the library on campus. The electronic catalog was basically a replica of the card catalog, and we still had to go to the library to use the terminals. But in the mid-1980s, when institutions began to install electronic networks, the terminals in the catalog room of the library ceased to be the only means of access to the catalog and the collection. One could consult the catalog from the office, the dorm room, and the study at home. The next stage in this development has already begun. By connecting local area networks with national and international networks, the libraries of individual universities can become resources for scholars and their students everywhere a terminal or workstation is plugged into the network. The realization of this potential requires a good deal of research and development, which is underway in many institutions.

Perhaps more important, the computerization of the catalog soon began to change the way one looked up things in the library--the way one used the library. With the creation of sophisticated search techniques and the introduction of very fast computers, the electronic catalog became a powerful bibliographic tool. This development is changing the organization of scholarly work.

Since it became a science in the nineteenth century, cataloging has provided an orderly system for recording the possession and location of books and journals in the library's collection. Bibliographical studies, the foundation stones of all projects of research, had to rely on special bibliographical aids, usually published in scholarly journals. A computerized catalog permits the unification of the bibliographical and locational processes. As journal indexes are added to the computer databases that record the holdings of libraries, keyword searches become an acceptable, even a preferable, strategy for finding the materials one might want to consult.

The enhancement of the catalog as a bibliographical resource is continuing at a rapid pace. Across the country, some university libraries are experimenting with adding abstracts of articles to their catalogs, which will greatly enhance their bibliographical usefulness. Some are also adding descriptive material to catalog entries, which will have the same effect. Finally, several groups around the country are developing means of handling visual materials. These on-line catalogs permit users to find pictures by descriptive terms, to browse a series of images, and to study particular items on the screen. One example is the Advanced Technology Group at UC Berkeley, which is beginning the large-scale project of cataloging the 250,000 slides in Berkeley's architecture library. During the next ten years librarians will make much progress in adding to the store of cataloged items.

The improvement of cataloging is not the only feature of current systems of library automation. The computer system provides librarians with new control over acquisitions, serials, and circulation. This last part of the system has made it possible for users to learn not only whether the library holds an item, but also whether it is on the shelf or checked out to another user. Having found an item, a user can order it directly through the computer link-up, asking the library to hold it at the circulation desk or to deliver it to a campus address. Several campuses of the University of California have instituted such document delivery systems.

This revolution in library automation is changing the way the academic community functions. The new automated library reaches out to coteries of learners wherever there is a computer terminal; so that at any moment a classroom, a laboratory, a faculty office, or a dorm room can become a part of the library's catalog room. This development does not change the basic academic culture of the written word or visual image, but rather extends it. The library building remains the primary place where faculty and students consult books and journals--and the production of printed books and journals has continued to grow at a fast pace--but members of the academic community can obtain bibliographic information about the library's collections wherever they find themselves.

The automation of bibliographic access to the library enhances the University's effectiveness, because teaching and learning are communal activities. Socrates did not create philosophy in his study, but in the *agora*, the marketplace, surrounded by people. The use and creation of knowledge is most often a group activity, and to put the information about the resources of the library at the disposal of the myriad academic groups on a campus is to quicken the intellectual life of the institution.

Although some of these aspects of library automation are still in development, all of them are based on current technology and all represent aspects of the library that will be effectively deployed by the end of the century. During the 1980s, we have been defining the capabilities of computer technology. During the 1990s, these capabilities will become practical elements of everyday library functions. We cannot expect all library materials of whatever type to be entered in the libraries' electronic database, but adding materials to the system will become a mundane task. Funding, not developing, the process will be the principal concern of University, campus, and library administrations.

b. *New Electronic Sources of Information*

The progress in automating access to library collections is moving rapidly, but it is only one aspect of the electronic revolution in information technology. The amazing growth in the production of printed books and journals pales in comparison with the growth of electronic databases of all sorts. One holds all Dow Jones publications for the past forty-five years. Another contains protein sequences. There are databases of journal article abstracts, census data, economic data, political and sociological data, and bibliographical data.

Some of the databases are the products of commercial enterprises; others were created and are maintained by scholars or research institutes or libraries. Moreover, the makers of databases continuously revise them, so that the electronic database is almost like a living organism. One does not buy it, as one does a printed book or journal, but purchases access to it, so that faculty and students can use it always in its current "edition." It is now impossible to imagine a university that does not have access to databases; it would be no different from imagining a university without a library. This raises the question: To what extent are databases just another source of information that should be added to the library collection?

This question is now among those uppermost in the minds of university librarians and administrators. The computerized library catalog is a database, and so libraries already have the means of providing access to other databases. The MELVYL catalog has made MEDLINE, a database service of the National Library of Medicine, available to its users, and it is putting *Current Contents*, a commercially produced index of journals, on line. Throughout the University, faculty, librarians, and administrators are discussing the policy questions raised by the proliferation of databases that contain information vital to the academic enterprise:

- o Should databases be treated as library materials--i.e. provided at no cost to users--or should the library only provide a means of gaining access to them--i.e. users would pay a fee for use?

- Should they be mounted, like MEDLINE and *Current Contents*, on MELVYL and, therefore, be available through the University's union catalog, or should they be mounted by the libraries or computing centers of individual campuses?
- Indeed, which databases should be mounted by libraries and which by the computing centers or other units? What are the fiscal and other consequences of choosing one or the other institutional location?

The responses to these questions are as important to the administrations of existing campuses as they will be to those of the new ones. The effective allocation of resources for information services depends on the responses, which answer the central question of the academic enterprise:

What information is available to the academic community and how shall it be provided?

The committee does not think that all electronic databases need to be treated in the same way. It is clear that some should be mounted in a central facility like the Division of Library Automation, some mounted on the campuses, and some not mounted at all, but made available through off-campus network services.

Nonetheless, to build a library that can support the instruction and research of a new University of California campus, the University will have to resolve certain policy issues about the new electronic sources of information.

The University must establish procedures and criteria for deciding how the new forms of publication will be made available. The committee recommends that the libraries be given primary responsibility for making electronic materials available because users of these sources require assistance similar to that offered for other information technologies. Users need to know what databases are available and what they contain. These are the same questions asked about books, journals, and other elements of the library collections. The campus libraries will undoubtedly share the cost of acquisition of some electronic sources, just as they now engage in shared acquisitions of some printed materials. Library Council has recently agreed to add electronic sources of non-bibliographic knowledge to the shared-acquisition system on a trial basis. The outcome of this experiment will be part of the environment within which the new campus libraries grow.

The specific choices to be made in the formation of the new libraries depend on general policies governing the University Library's collection development, including the policies on acquisition and access to electronic databases.

Consider the following as examples of the kind of specific questions that rest on such policies:

- What should the composition of the opening-day collection be? The answer will depend on what parts of the University's collection of printed and visual materials and databases will be accessible from the new campus. It will also depend on established policies concerning which non-bibliographic databases are to be acquired by campuses and which provided from central or non-university sources.
- How should the new campuses design their library buildings? The answer depends on the nature of the collection and the way users will work in it, which will be affected, in turn, by decisions about collection development and document delivery as well as technology.

To make good choices in matters such as these, the faculty and administrations of the new campuses must understand the University's library environment. The existing definition of that environment, as represented by the *University of California Plan for Libraries* and the Voigt-Susskind formula for funding the development of the University's library collection, are the basis for the future, but the University needs to decide how to integrate new technologies, new sources of information, and new services into the basic structure they provide.

c. *The Library on the New Campuses*

The first thing to say about the new libraries is probably the most obvious: Opening-day collections should reflect the first academic plans of the new campuses. Indeed, the librarians of the new campuses should participate in academic planning because they can offer valuable insights into the ability of the library to support the different disciplines. This means that the campuses should appoint their librarians to the founding group of scholars and administrators.

The automated library will be a repository of information that extends beyond the traditional collection of books, journals, and manuscripts to include visual materials and non-bibliographic electronic databases. This library will be a place both for the collection of information in printed and other formats and for those who wish to work in the collection. None of the foreseeable changes in technology will reduce the centrality of the library as a distinct component of the campus environment.

Yet, in the future, the campus library will be imbedded in the fabric of the institution, and its collection will only be one part of what it offers to its users. The library collections of universities already contain records of items housed in remote locations--accessible through electronic and other means--and the size of this element of the collection will grow steadily from now on. By the time the University establishes its new campuses, the quality of a library will be defined not only by the number of volumes it has on its shelves, but also by its ability to give faculty and students access to the materials they need. The committee recommends that the University develop a model for the library of the future based on the notion of access to the sources of information. The basic question is: What information is accessible to users? This question leads to others: What is the standard of delivery by which accessibility is measured? What is the cost of the various elements of a collection that is accessible through local lending, interlibrary loan, and electronic media? Just as the founders of the libraries begun in 1960 developed a model of the opening-day collection, so the founders of the libraries of 2000 must create a model of the collection defined by new services and new media.

Nonetheless, the committee wants to emphasize that the new sources of information do not, for the most part, replace printed materials, which scholars and publishers continue to produce at an increasing rate. The fact is that the civilization is producing more and more information in more and more forms, and, if the University of California is to be a significant locus of academic work, it must obtain the funds to collect, as it has in the past, the relevant portion of that mass of new knowledge.

Moreover, the universalization of the library, symbolized by the creation of an effective single University of California library, will not reduce the obligation of individual libraries to collect, organize, and house the material records of our expanding body of knowledge. The extended library of the future will be a composite of university and other libraries across the state and country, and its very existence rests on the collecting activities of individual libraries. The great university will still need a great library, but it will also need access to the libraries of other great universities and research institutions.

Finally, in order for the new libraries to take full advantage of the resources in existing UC libraries, the University must expand the system of interlibrary lending and continue effort to convert all bibliographic records to machine readable form. Campus libraries are at present unable to meet the demands of users on other campuses because interlibrary loan services are inadequately funded and because major portions of the UC's collections remain unknown to the MELVYL catalog.

2. The Academic Computing System

a. *History and Existing Conditions*

If the library is the primary repository of information, the computer has become one of the essential tools for the creation and manipulation of information. University curricula have always taught the mechanisms developed by our civilization to order and extend knowledge. Mathematics and logic were the first techniques of rational thought and have been the basis of our learning at least since the time of Plato and Aristotle. Over the centuries, scholars have developed these techniques--and demonstrated their essential unity--and with each major development has come a corresponding extension of our fund of knowledge and understanding of ourselves and our world. The computer is one more step in this ancient process of our collective intellect: it permits us to grasp ever more information in our minds and to operate on that information with ever more strength. If the university is to be one of our society's principal engines for intellectual progress and the creation of technology, then it must possess the tools necessary to that task.

Academic computing was a creation of the 1950s, when computer centers housed massive machines to which scientists and engineers brought great offerings of keypunched cards. The use of computers throughout the academic disciplines took place only after computing became interactive. This change occurred with the move from the cards to large-scale electronic disks and memory, when a computer could hold in its electronic brain both the program and the data to be studied. Once this happened, the user could sit at a video terminal and interact with the computer, giving instructions, getting results, and giving additional instructions--in other words, engaging in a conversation with an obedient, if not always forgiving, intellectual servant.

The first stage of development of the new machines was a continuation of the era of the large mainframes, which offered generic computational power. The second stage resulted from the development of increasingly specialized machines. It was not only that the giant machines of the first stage were quickly made obsolete by technological development, but also that the next generation of machines was designed for specific purposes. The first stage of academic computing revealed the ways scholars could use computing; the second stage provided the machines to realize that potential, from desktop machines for wordprocessing and arithmetical operations to minicomputers for statistical work on large sets of data and supercomputers and parallel computers for solving immensely complicated problems. The progression has been to put more and more computing power--processing speed, memory, and electronic storage--into smaller and smaller units. Today's microcomputers are faster than ten-year-old minicomputers; today's minicomputers are faster than ten-year-old mainframes; and today's mainframes are faster than ten-year-old supercomputers.

The development of specialized computing "platforms" has led to a distribution of academic computing on campuses. In research, individual faculty, laboratories, and departments could purchase machines particularly suited to their needs. In teaching, faculty in departments and interdisciplinary programs could set up specialized instructional facilities to support their courses. In many disciplines, the trend has been toward microcomputer laboratories and away from banks of terminals attached to a minicomputer or mainframe housed in a central facility. In the sciences and engineering, which require great processing power, the centralized facility remains the best choice for instruction and research.

The result of these trends has been that campuses have a mixed academic computing environment. The computing center still exists to provide large machines for instruction and research in certain fields, but many departments have established their own specialized computing facilities, and most faculty now own desktop computers. The computing centers are also acquiring highly specialized machines, which the campus community as a whole, but no one group of users, can support.

Which way should campuses drive this development? That is one of the most controversial questions among all those concerning academic support services. And, as in the case of the library, the growth of the electronic network has greatly affected the strategic planning of academic computing. In fact, the growth of networks may shift the focus of this question from technology to educational policy and cost. To the user connected to a network, it does not matter where the computer is. It could be on the desk in front of him or her. It could be down the hall in a departmental computing facility, across campus in the academic computing center, or across the country. Today, American physicists can sit in their offices and work on computers located in Europe.

In these circumstances, the decisions about the centralization or distribution of computing power on a campus will depend primarily on educational policy and fiscal considerations. To be sure, the capacity of the network has an effect because some uses of the computer generate huge packages of data that require broad highways for transport. For such operations, a local computer may be the only acceptable option. But the size of the electronic highways, as well as their extension, is growing rapidly, and it looks like educational and financial considerations will determine the geography of academic computing in the future.

Existing campuses will have almost as much opportunity as the new ones to create, or recreate, their computing systems. Because of the rapid development of computer technology and the relatively short lives of individual computers, the computing systems on existing campuses have already gone through two or more generations. Campus computer systems are therefore going through an almost continuous evolution.

b. *Academic Computing on the New Campuses*

At this point in the evolution of campus computing systems, it appears that a mixed constitution will be the best organization for the future. The administration of the computing center can offer significant economies of scale in managing computing facilities for instruction and in providing highly specialized computing environments, such as supercomputers and massively parallel computers, for research. Departments, laboratories, and individual faculty must be able to build and, when appropriate, manage specialized computing systems that suit their instructional and research needs.

The computing center may offer many services for the faculty and staff attached to the network. It should probably provide repair services for specified types of computers and technical support for use of common software packages, and it can be the vehicle through which the campus purchases site licenses for such software. It can also provide a backup service for protecting the data stored on computers hooked up to the network. Most important, the center should supervise the computing system--making certain that the campus has the variety of machines it needs, reducing duplication of facilities where the network can provide users with adequate access to existing facilities, and helping the Academic Senate and administration with strategic planning for the evolution of the campus computing system.

In this environment, the watershed of decision-making will concentrate on the issue of centralization versus distribution of the elements of the computing system. Administrators will have to judge when to permit individual departments or research groups to develop their own computing facilities and when to insist on the use of the campus computing center. They will also have to decide which system functions should be managed from the center and which left to the administration of the independent operators. The overall success of the computing system will be judged by how well it balances centrifugal and centripetal forces to provide an effective computing environment for the campus.

The committee believes that the academic computing system should be an open medium of discourse among faculty, students, and academic staff. Therefore, while the campus computing environment will be composed of components--some developed by a computing center, others by departments and groups of faculty--it should be a single entity. At best, all parts of the computing system should be attached to an electronic network to provide communication, the means for collaboration in research, and a flexible computing environment. Flexibility is essential in the computing system because it will permit individuals and groups on campus, when necessary and appropriate, to take advantage of all available computing resources. It is even conceivable that the University's network will eventually be both broad and reliable enough to unify the campus environments into one vast University of California computing system.

To realize this vision, the computing system must be put on a firm institutional footing. The system should be operated by a comprehensive organization of specialists who maintain the campus computing platform and provide faculty and students with professional assistance in using it. Although the administrations of the new campuses should determine the exact shape and structure of such an organization, the committee can describe its general characteristics.

- It should be budgeted to take into account the characteristics of a good academic computing system. Funding should be provided for the purchase, maintenance, and replacement of computing equipment and for staff.
- It should have a staff based on the number of students and faculty on the campus. While some staff might work in the computing center, others might be assigned to departments, where they would be responsible for helping faculty and students use computers effectively in their particular academic pursuits.
- The University's space standards should include space for the academic computing system, as it does for the library.
- The University should design its buildings to accommodate changes in computing technology.

This organization is like the library--its special province being computers instead of sources of information. The University must recognize the need to give academic computing a stable institutional and professional base, both within the organization of its campuses and within the budget.

This recommendation takes the existing organization and budgeting mechanism of the instructional use of computers (IUC) a large step beyond where it is at present. Academic computing serves instruction, research, and public service--in short, all aspects of the University's mission--and should be organized and managed comprehensively to provide support for these functions. The computing organization should provide an administrative structure through which the Senate and administration can implement decisions about the shape and capacity of the system.

Finally, the relationship between academic and administrative computing requires some attention. On existing campuses, these computing operations are sometimes joined and sometimes separate, depending on history rather than on strategic planning. The committee believes that new campuses should consider the coordination of administrative and academic computing because it sees the same organizational and budgeting issues in administrative as in academic computing. Yet, it recognizes that there are significant differences in emphasis and function between academic and administrative computing, and it therefore hesitates to make a strong recommendation on this question. Under any circumstances, administrative computing should be part of the single system image; its services available to those on campus authorized to use them.

3. Educational Technology

a. *The Current System of Educational Technology*

Educational technology enhances the basic means of developing students' intellectual skills and transmitting information. The elemental forms of educational technology are language and pictures through which learners have acquired skills and knowledge since the beginning of human culture. These primitive technologies of education are the foundation of the fundamental medium of teaching and learning--discourse between teachers and students. Advanced technologies are useful only because they enhance the effectiveness of this medium of exchange.

This point may seem self-evident, but we make it because many people seem to think that new technologies will transform the educational process and change the nature of universities in fundamental ways. The fact is that technology contributes to teaching and learning by enhancing the effectiveness of verbal and pictorial communication between students and their teachers. Until recently, the technology available to help teachers teach skills and deliver information has consisted of fairly simple devices. The hanging map and the projector--slide, overhead, movie, and video--enlarge images and written material and make it possible to bring these sources of information to bear in class. These techniques, and the microphone, have permitted universities to use their faculty more efficiently--in the sense that they can teach many more students with them than without them--but they have created countervailing difficulties. The increase in the ratio of students to teachers has led to a decline in the amount of interaction between the teacher and his or her students, with the result that we have had to rely on graduate student assistants and other intermediaries to create the crucial one-to-one exchange that is the heart of education. One of the commonest complaints about contemporary universities has been that teaching assistants do a high percentage of the teaching, especially at the lower-division level.

The computer improves but does not change the existing instructional technology. Already, faculty have used the computer to create visual aids for teaching difficult subjects, such as electromagnetic radiation, where verbal and mathematical descriptions have generally failed to make the matters clear. Once the process of projecting computer screen images onto large screens is perfected and made cost effective, the computer will give faculty control over hundreds of images, recordings, and video tapes for class presentation. In many disciplines, preparing a lecture will include selecting digitized slides, compact disks, and videos for entry into a computer, and the capacity of contemporary disks will permit the teacher to take large collections of additional materials into class. If a student's question or the course of discussion leads in an unexpected direction, the teacher will have virtually everything he or she needs at hand in the disk of the computer.

These developments are exciting. The computer will increase the effectiveness of slide presentations, "animate" maps so that students can see the changing face of a place or region in a period of political, economic, or social upheaval, and bring a body of data to a classroom screen to show how we might analyze and interpret it. Faculty will continue to use the traditional technologies, particularly television, which faculty have not yet used to its full potential, but there is no doubt that the computer will make the experience of the classroom more visual than it has ever been. The term "lecture"--harking back to medieval practices--will lose its legitimacy in most fields of study; "classroom presentation" will be the proper term.

The computer will be no less important to out-of-class education. Once computer workstations are sufficiently available on campus, students will be able to do a great deal of their work on them. This means that faculty will be able to design assignments to use the capacities of computers and to use the educational software that will soon become widely available. Yet, the computer may not be the most important element of the educational technology of the future. Once students have ready access to computers, the network will create a new educational environment within which university teaching and learning will flourish as never before.

b. *The Educational Technology of the Future*

While not excluding the older forms of educational technology, our vision of the environment on the new campuses focuses on new technologies. The computer and the electronic network promise to enhance the interaction among the members of the academic community. A computer network such as Project Athena at the Massachusetts Institute of Technology puts faculty and students into contact with one another. Students can send draft papers to faculty for intermediary assistance; they can put out a question about any topic for anyone on the network who happens to know the answer; and all on the network can participate in planned and impromptu exchanges. The Athena system is not just a new device for using language and pictures, it is a new medium for the educational process.

University of California campuses are creating the telecommunications systems that will serve as the backbone of a computer network linking students to one another and to faculty, but the computers themselves are only haphazardly distributed on the network. To create an Athena-type system, UC campuses must put powerful computers into the hands of every member of the community. This does not mean that each person must necessarily have a computer, but that the availability of computers must be sufficient to permit students and faculty to interact through them. The best analogy is the telephone, which is widely enough distributed to permit easy access to all who need it.

The creation of a computer network will permit faculty to assign work and students to do that work and submit it more easily than is now the case. Faculty will post assignments on electronic bulletin boards, and students will submit homework across the network. Today, we use computer laboratories to provide students with computer-aided instruction; the technology exists to make the whole campus into a flexible laboratory useful to a great variety of disciplines. Nonetheless, highly specialized uses of computers, such as graphical and musical applications, will continue to require specialized facilities.

The network will not have so revolutionary an effect in the classroom as it does in out-of-class functions of the academic community, but there will certainly be an effect. Once classrooms are hooked up to a network, faculty will be able to import images, video, and data from facilities far afield. These tools for teaching are powerful and much to be desired, but they will not create an educational revolution. They constitute an enhancement of the ways we have long brought information to the attention of our students and colleagues.

The revolutionary aspect of the new educational technology inheres in the network as a new environment for communication. To the activities of the classroom, the office hour, and the informal "bull" session of the dormitory add the electronic network as a medium of teaching and learning. Moreover, as with those older media of exchange, the new environment's potential for extending the knowledge and understanding of our students and ourselves is both obvious and indeterminable. As noted earlier, it will create new types of assignments, give students new ways of completing them, and make possible classroom demonstrations of great power and flexibility. This much is foreseeable; it is impossible to guess at the full range of creative uses to which faculty will put the network in constructing and teaching their courses.

c. *Instructional Development and Educational Technology*

To achieve the full potential of the new educational technology and to improve the use of the older methods, faculty will need more help than is now available to them. The use of technology is part of the general process of instructional development, and a few campuses of the University have recognized this by coordinating the administration of instructional use of computers and instructional improvement. Yet, it is clear that even more coordination would be advantageous and that most campuses need to establish an institutional framework within which the general process of instructional development can work smoothly.[2]

Today, faculty revise existing courses and create new ones without significant institutional assistance from the University. Campuses provide some resources to help faculty develop and improve their courses, but these activities are rarely integrated with campus efforts to expand and improve the use of educational technology. The committee believes that the effective use of the new educational technology requires a new, comprehensive approach to instructional development.

Campuses should make certain that decisions about the use of funds earmarked for the instructional use of computers, the improvement of courses, and the improvement of teaching are well coordinated. The committee cannot specify the institutional structures for achieving this goal, but it can set forth the principal characteristics of the organization.

- First, the effective use of instructional technology will require the creation of a professional staff to help faculty. Faculty would bring to members of this staff a set of educational goals and ideas about how the course materials should be organized. The professional staff should help them use technology, new and old, to achieve these goals and present the materials in the most effective manner. The staff should therefore have a knowledge of effective techniques of teaching, of the technologies available for use with those techniques, and of the characteristics of the different academic disciplines. Some members of the staff might, therefore, be assigned to individual departments or specialize in particular disciplines.
- Second, the funding for instructional development and educational technology should be put on a firm basis. The University should establish budgetary formulae that take into account student enrollment, the nature of the campus academic programs, and the need to maintain and keep up with the technology. In addition, space formulae should recognize the needs of instructional development, which include office space and facilities for the use, storage, and maintenance of instructional technology.

By making the use of educational technology an integral part of instructional development in its full sense, the University will certainly increase the use of technology in the educational process. This will not make the University more "efficient" by making it possible to increase the student : faculty ratio, but it will help make the current ratios effective. The existing environment for intellectual exchange consists in the small class, the office hour, and casual contact of the campus. Educational technology, particularly the computer network, will be a new element in that environment. The interaction of students and faculty on the network has the potential of greatly increasing the effectiveness of the face-to-face interaction of the classroom. In sum, instructional development should become a recognized function of every campus, standing side by side with the library and academic computing.

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[2] On the unity of instructional development and educational technology, see Michael J. Albright, "What IS This Thing Called Instructional Technology?," *Teaching and Learning at the University of Hawaii at Manoa*, vol. 3, no. 3 (1989), published by the Office of Faculty Development and Academic Support.

4. The Electronic Network: Backbone of the New Academic Support Services

The melding of these three components--the library, academic computing, and educational technology--into a single academic support system requires the establishment of a first-rate system of telecommunications. This system must have broad highways for the transmission of data and images to all parts of the campus, must be connected to regional, national, and international networks, and, once established, must be kept up to date. The network will give faculties and administrations flexibility to plan the computing system, the library (including collection development and the design of buildings), and educational technology.

What is required to develop an adequate network? First, the need for the system must be recognized in capital planning, so that the campus itself and every building on it have built-in capacity for telecommunications. In planning the campus and buildings, the administration should take into account the rapid evolution of communications technology. The leitmotif in the history of telecommunications is change, and campuses must plan with this in mind. The budgeting of communications equipment should assume the need to replace and improve it on a regular schedule. Buildings should have space for telecommunications equipment, appropriate heating and ventilation systems, and the like.

Second, campuses should establish network administrations with the authority to impose campuswide standards for communication compatible with regional, national, and international standards. The imposition of standards will enable the campus to maintain the open and comprehensive educational environment that the committee believes is essential to a healthy university. The committee recognizes that research groups will sometimes want to build computing systems of unique design incompatible with other campus systems. Only rarely, however, will the faculty in these groups want to be cut off from the campus network, and the network administration should encourage and help them maintain contact with colleagues and University services, such as contract administration and accounting.

The goal of network design should be to create an open environment for intellectual discourse. In establishing their networks, the faculties and administrations of the new campuses should decide how much information should be provided to members of the community about distributed computing resources and departmental and institute libraries. We assume that the offices responsible for the various elements of instructional development will provide complete information on educational technology. Obviously, existing campuses also should consider this issue.

RECOMMENDATIONS

1. A Single System Image: The Electronic Network

- The academic support services of the new campuses should be developed within a single system image based on an electronic network that extends broad highways throughout the campus and connects to regional, national, and international networks. Faculty, students, and staff should gain access to the components of the academic support system through the network as well as by going to their physical locations.
- In the physical and capital planning of the new campuses, provision should be made for the network; the campus and its buildings should be designed to accommodate future developments in the technology.
- The campuses should establish administrative offices to manage their networks. These offices should have the authority to impose communications standards and should have a budget sufficient to keep the network up to date. Campus administrations should set up the structure of the network office to suit campus conditions; the committee is only concerned to emphasize that the management of the network must be centralized.

2. The Components of the Academic Support System

a. *The Library*

- The opening-day libraries of the new campuses should be fully automated segments of the University of California Library under the *University of California Plan for Libraries* (1977). They should develop collections of books, journals, and other materials based on the academic plan of the particular campuses. To ensure that library supports its academic programs, a new campus should appoint the librarian very early in its development.
- While existing models and formulae for funding collection development, staffing, and library space will determine the growth of the new libraries, the committee believes that the design of the new libraries must take into account the new sources of information and new technologies for storing and using the record of a library's holdings.
- The strength of the new libraries should be measured by the access they give to printed, visual, and electronic materials. In developing the opening-day campus collections, library planners should provide for the maximum possible access to materials from other UC collections and for delivery of electronic sources of information. Nonetheless, it is important to recognize that campus libraries are at present ill-equipped to respond to a large demand for their materials from new libraries. The University would have to expand interlibrary loan services and complete the retrospective conversion of library records to machine-readable form to realize the goal of giving the new libraries the maximum possible access to materials in existing UC libraries.
- Information about library collections should be accessible from virtually all locations on the new campuses through the electronic network. As the communications technology improves, the network should give users access to information about library resources across the country.
- The new libraries should establish document delivery systems to serve their campus communities. In establishing library services, the new libraries should benefit from the systems of existing UC libraries.

b. *Academic Computing*

- The new campuses should establish academic computing systems that are as open and flexible as possible. By openness, the committee means that the academic computing system should have the potential to include all instructional and research computing facilities on campus unified by the electronic network. Nonetheless, the computing system will be composed of centrally administered and independent units. Decisions about computing will focus on the institutional and budgetary issues raised when departments and research groups want to build their own computing facilities. The committee believes that decisions to permit such groups to go it alone should rest on the academic plan of the campus, not on principles of organization.
- The campuses should establish policies for operation of the central facilities, for staffing instructional and research computing facilities throughout the campus, and for managing the academic computing system as a whole.
- The academic computing systems should be budgeted under formulae similar to the existing formula for instructional use of computers. The budget must be comprehensive and straightforward if the computing system is to provide support for the academic programs of the twenty-first century.
  - The existing budget for the instructional use of computers contains some elements of an adequate funding formula, but it lacks at least one crucial part because it does not take into account student enrollment and the number of faculty.
  - In parallel to other aspects of the University's program of research, the computing budget should support the use of computers in research. Faculty can be expected to continue to obtain extramural grants for computing, but the University should establish a base level of

research computing. The budget for research computing should take into account the number of post-doctoral students and research staff.

- o Finally, the comprehensive budget formula for computing should reflect the nature of campus academic programs and the need for regular replacement of equipment.

o The committee recommends that new campus administrations consider unifying administrative and academic computing, but it does not have a definite recommendation on this question. Administrative computing should, however, be part of the single system image established by the network.

c. *Educational Technology*

o The committee recommends that the new campuses coordinate instructional development with academic computing (particularly instructional use of computing) to assist faculty incorporate the elements of educational technology into the curriculum.

o The campus programs that provide consultation and machines for instructional technology should be budgeted under formulae that take into account student enrollment, faculty FTE, and the nature of campus academic programs. The budgets should cover staffing and technology (computers, projectors, audio components, media equipment). The functions and budgets of existing audio-visual services and media facilities should be incorporated in the new comprehensive budget for instructional technology.

o The most important element in instructional technology services will be the size and quality of the staff. Staff members must have knowledge of the various academic disciplines they serve--much like subject bibliographers in the library. They must have credibility on with faculty and students because one of their tasks will be to encourage the innovative use of technology.

o Instructional technology services should be offered both through the electronic network and in various campus locations. Consequently, the University should develop space standards to ensure that campuses have adequate and well-designed space for instructional technology service organizations. At the least, these organizations will need offices, electronic shops, storage, and demonstration facilities.

CONCLUSION

In establishing the academic support system, the founders of the new campuses should aim to create a single system image or environment. The committee sees a clear distinction between the library as the repository of information sources and the computing system as the network of devices used to create and manipulate information, but in its vision these two functions are part of one environment. The faculty and students of the new campuses should have ready access to an electronic network that includes the library, databases (wherever they reside), and a variety of processors. The members of the academic community should work on the campus network just as they work in campus buildings, but the network should also connect them to the world at large. They should be able to use the resources of the University of California Library and, when necessary, the power or special capabilities of distant computers. They should be able to communicate with one another and with colleagues and peers throughout the UC system and elsewhere in the world.

To the users, the system of academic support services should be a unity, formed by the comprehensive computer network of the campus. This network should unify the community by giving it an electronic as well as a physical environment, but it should also increase the possibilities for small group interactions among members of the community. The system will not replace the social community of the campus, but it will enhance that community, while giving it increased access to other colonies of faculty and students around the world. In these ways, it should increase the university's ability to educate students and to contribute to the civilization's accumulated knowledge and understanding.

UNIVERSITY OF
Miami

Date: June 15, 1990

To:

From: L. MacCorkle
COMPASS
Richter Library (x4838)

Re: **User information on data collections available through ICPSR**

The University of Miami is a member of the **Inter-University Consortium for Political and Social Research** (ICPSR) at the University of Michigan, the world's largest repository of survey data for secondary analysis in the social sciences and humanities. Richter Library is the intermediary between ICPSR and the University; students and faculty who are interested in using a particular data collection must request it through COMPASS. Data collections that are not available through ICPSR may also be acquired by COMPASS for use by University researchers.

Please read the following information on identifying, ordering, and using data collections that are acquired for you through our membership in the Inter-University Consortium for Political and Social Research (ICPSR) at the University of Michigan. For additional information please contact me or visit my office on the second floor of the main Library.

1. Identifying data collections available on campus: Rtapes

Rtapes is a database on the University IBM mainframe that includes information on tapes the library has acquired. Rtapes includes a content summary of the data collection, tape information, the tape volser number and keyword access. You are encouraged to use this database to find out what data collections are available on campus.

Rtapes also indicates whether or not the data collection is currently available "online" or must be retrieved from the archive in the Library and taken to the computer center for loading. The information on Rtapes is updated every two weeks.

2. Identifying data collections that are available through ICPSR

ICPSR publishes the Guide to Resources and Services and the ICPSR Bulletin, a quarterly journal, which provides information on new data collections available and updates to others. The Guide and issues of the Bulletin are available for you to use in the COMPASS Office, Richter Library.

Otto G. Richter Library, P.O. Box 248214 Coral Gables, FL 33124
(305) 284-3551

You may also order the Guide by contacting: Janet Vavra, Technical Director, ICPSR, P.O. Box 1248, Ann Arbor, Michigan 48106 (313) 763-5010. Subscriptions to the ICPSR Bulletin may be arranged by contacting: Mary B. Vardigan, Editor, ICPSR, P.O. Box 1248, Ann Arbor, Michigan 48106 (313) 763-3486. There is no charge for these publications.

3. Ordering procedure

Once you identify the data collection you need, send a dated memo or letter to me describing the data collection(s) or part of a collection that you want. I will then send an order to the University of Florida requesting the data.

One copy of the study documentation (or codebook) that describes the data and where it is located will be ordered for my office. If you bring a requisition to me, I will order an additional codebook for you. You may also order it yourself by calling (313) 763-5010 or writing Janet Vavra, Technical Director, ICPSR, P.O. Box 1248, Ann Arbor, Michigan 48106. The cost is found in the ICPSR Title-Documentation Index in the back of the Guide. Some data collections include the code book on the tape. This is usually indicated in the Guide.

4. Tape specifications

All tapes that we receive through our ICPSR membership have the following specifications: Density: 6250 b.p.i.; Track: 9; Mode: EBCDIC; Parity: Odd; Label: No label

5. Time factors

The University of Miami belongs to the ICPSR through the Florida Consortium for Political Research at the University of Florida in Gainesville.

Our orders compete with the requests of nine other Universities. If the University of Florida has the data it takes between 1 to 2 months to get the tapes. If the data must be acquired from ICPSR it takes 3 to 4 months.

If I ask that an order be expedited, it speeds up the process somewhat. The average order takes 1 1/2 months. It is critical that you order the data collection long before you actually need it.

I have no way to monitor where your order is in the queue, so I cannot tell you exactly when your data will arrive. However, when there seems to be an unusual delay I will, at your request, contact my counterpart at the University of Florida.

6. Notification

Within two weeks after the dataset is received, it is available on the University mainframe. When the archival tapes and documentation are returned to me, after being processed by Information Resources, I notify you that your tape is ready to use.

All the information needed to access the tapes can be picked up in my office or sent to you. Information is entered into the Rtapes database at the next update.

If there are problems in accessing the tape or in using the operating system please notify Bob Syren (x3980) or Gonzalo Garriga (x3972) at Information Resources.

7. Information Resources will assist you in using IBM/CMS and with statistical packages

The following individuals at Information Resources will assist beginners and others in using the IBM operating system, accessing the tapes, using SPSSX and SAS and in activities such as copying tapes and extracting data for downloading to a micro.

For assistance in using SAS or SPSSX contact: Bill LeBlanc (x3915) or Susana Rojas (x3928).

For assistance in using the IBM or accessing your tape contact: Bob Syren (x3980) or Gonzalo Garriga (x3972).

The IBM/CMS Primer and The Tape Primer are available at no charge to faculty in Room 217G Information Resources.

8. Data Check

When a data collection arrives in the Library, I check the tape information form against the order. You are advised to double check to see if all the files you need are included on the tape information form(s), especially if the collection has many datasets or when it is an ongoing study. The tape information form, of which you receive a copy, lists all the datasets associated with the data collection you requested and tells you what tapes they reside on.

Occasionally, the University of Florida fails to include a dataset in a large study. They send the omitted file quickly upon notification.

Note: You are responsible for checking the actual physical tape to verify that the files and the data therein correspond to the tape information form and the codebook. So far there have been very few problems with lack of agreement between the paper documentation and what is actually on the tape. Contact Bob Syren (x3980) if you have problems in accessing the data collection.

9. Datasets that are continually being updated and added to

I cannot request that updates be automatically sent to us. You are expected to monitor updates and new datasets added to an ongoing study. This can be done by checking the Guide and the Bulletin. At your request I will call ICPSR to find out when additional data is expected to be available.

10. Defective tapes

Occasionally a defective tape is sent. Again, this is handled very quickly by the University of Florida.

11. Summer Programs

The Inter-University Consortium of Political and Social Research has a respected Summer Program in Quantitative Methods of Social Research. Support is available in limited amounts through the Florida Consortium. If you are interested in finding out about this program please contact me. Applications close in the late Spring of each year. Information on these well attended classes is available in the COMPASS office.

Northwestern University Library
Staff Announcement No. 1312
August 9, 1990

Fostering Curriculum Innovation
Through the Use of New Information Technologies

The Library has undertaken an interdepartmental pilot program entitled "Fostering Curriculum Innovation Through Faculty Seminars on New Information Technologies," or, more informally, the Curriculum Innovation Project. The Project Director will be Brian Nielsen, with Betsy Baker serving as Assistant Project Director. Norman Weston will act as Curriculum Innovation Project Librarian, working closely with Marilee Birchfield, Instructional Services Librarian, and other staff in Reference and elsewhere to develop seminars designed to introduce faculty to various new computing technologies.

The goal of the Curriculum Innovation Project seminars is to integrate computing technologies into faculty research and ultimately into the University curriculum. The Project will integrate two user-oriented functions of the Library: (1) promoting the use and dissemination of new information technologies both within the Library and in the Northwestern teaching and research community at large, and; (2) actively pursuing the faculty outreach component of the Library's user education efforts.

An Information Technology Demonstration Laboratory in Room 1214 (opposite the Reference Conference Room) will be established for faculty and their students to preview, experiment with, and use microcomputer software on both IBM and Macintosh machines. Funding for this laboratory is coming from University budgetary resources, not internal to the Library. Areas of exploration in the lab will include textual manipulation software, online searching, bulletin boards, electronic mail, CD-ROM technology, hypertext, and online and local catalog access.

One notable element of the Project will be to foster faculty interest in and use of the Library of Congress "American Memory Project." Northwestern Library's Marjorie Iglow Mitchell Media Center has recently been selected by the Library of Congress as one of eight sites to beta-test for LC the "American Memory Project" workstation and database. In this segment of the Curriculum Innovation Project, Norman Weston will be working closely with Stephen Marek, Head of the Mitchell Media Center, other Media Center staff, and staff in the Advanced Technology Group of Academic Computing and Network Services. Efforts will be undertaken to integrate use of these tools into the NU curriculum. The American Memory Project itself (including a Macintosh computer, CD-ROM drive, laser disk player, laser printer, and video monitor) will be located in the Media Center's interactive laserdisk lab.

The impetus for the Curriculum Innovation Project stems from the Report on the Undergraduate Experience recommendations calling for the improvement of the teaching and learning environment at Northwestern. Norman Weston's current work with the student information system, recently dubbed "NUINFO," has helped pave the way for the Library to work toward integrating new information technologies within its other programs of general service to the University. We feel that this project will contribute substantially to modeling the kinds of learning experiences and supportive structures for faculty to become more familiar with these technologies.

Brian Nielsen
Assistant University Librarian
for Branch Libraries and
Information Services Technology

Betsy Baker
Head of Reference

NORTHWESTERN UNIVERSITY LIBRARY
STAFF ANNOUNCEMENT NUMBER 1332
OCTOBER 23, 1990

We are pleased to announce that arrangements have recently been made with Mead Data Central, a major electronic publisher, to provide access to the LEXIS/NEXIS service to students at Northwestern University through a new program for graduate journalism and business schools and the libraries which serve them. The Schaffner Library, with additional funding from the Medill School of Journalism, the Curriculum Innovation Project, and the Reference Department, has contracted with Mead to provide LEXIS/NEXIS. This arrangement will initially be for a one year trial period, beginning in September, 1990.

This online service makes it possible to search and retrieve the entire editorial content of hundreds of publications and electronic databases, including the Chicago Tribune, the New York Times, Supreme Court Briefs, Securities Exchange Commission filings and People Magazine. Nine passwords will be shared by Schaffner, Main, and Medill. These passwords allow for unlimited usage of non-royalty databases during all the hours the library is open, with no charge for printing of documents.

Librarians from Schaffner and the Reference Department will provide training and consulting first for Medill faculty and students and then for other appropriate groups. Norman Weston, Curriculum Innovation Project Librarian, will serve as LEXIS/NEXIS liaison for faculty on the Evanston campus. LEXIS/NEXIS will be available for searching in Medill's newsrooms on both campuses and in both the Schaffner Library and the main reference department. During this pilot year, Schaffner will also experiment with electronic document delivery as an alternative to intercampus loan.

Through this program, we hope to provide greatly improved access to this electronic resource and to learn about the benefits and challenges of providing end user searching and electronic document delivery. We look forward to an exciting and thought-provoking year.

Susan Swords Steffen
Betsy Baker
Brian Nielsen

The UNIVERSITY
of SOUTHERN CALIFORNIA

PROGRAM for the TEACHING LIBRARY

2 OCTOBER 1989

SHEPLEY BULFINCH RICHARDSON AND ABBOTT • ARCHITECTS • BOSTON

The CENTER for SCHOLARLY TECHNOLOGY

Recognizing that information technologies will profoundly change teaching and research in higher education, the Center for Scholarly Technology was created by the University Library and Academic Computing. The Center supports the creation of computer software for instruction, supports librarians in creating software for searching online information resources, and develops and evaluates prototype programs and facilities for the Teaching Library. The Center conducts these projects in collaboration with the University Library and University Computing Services.

OBJECTIVES AND CURRENT PROGRAMS OF THE CENTER

1. Using information technologies for instruction and research

   a) Assist with the design and implementation of databases on USCInfo, the Library's online information databases on the USC digital network. USCInfo includes bibliographic databases in biomedical science (Medline), science and technology (Computer Database, Applied Science & Technology Index, General Sciences Index), current news (National Newspaper Index, Magazine Index), business and industry (Management Contents, Trade & Industry Index), social science (Social Sciences Index, Library Literature), and art and humanities (Art Index, Humanities Index).

   b) Assist scholars in using information technologies to produce both electronic and high quality printed documents.

2. Instructional and training activities

   a) Instruct in the use of USCInfo and the creation of personal bibliographic databases.

   b) Instruct in the use of programming software and tools to create instructional applications.

   c) Sponsor speakers and conferences on advanced information technologies useful to higher education.

continued

3. Software consulting, design, and production

   a) Maintain a reference library of useful software products for instruction and research.

   b) Consult with faculty, librarians and staff who are writing software for instruction and research.

   c) Production of prototype instructional software for both class and library use.

PROTOTYPES FOR THE TEACHING LIBRARY

A primary goal of the Center is to develop programs and resources to ensure that the Teaching Library is a vital part of the campus community from the day it opens. Since 1986 there have been experimental information centers ("Library Satellites") which are prototypes of Teaching Library programs and services. Today these include:

a) In College Library, a prototype library computer cluster, where the Center and the Freshman Writing Program have developed software to teach students to do bibliographic research using USCInfo, and to write research papers.

b) In King Hall, a prototype instructional facility where USCInfo classes are taught, and in the Colonial Room in Doheny Library, a facility for group instruction.

c) In the Doheny Library, the Electronic Publishing Center, where electronic documents can be created and published.

d) The Software Library, under development in the Science and Engineering Library.

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e) *Birnkrant Hall, where consulting on the creation of personal bibliographic databases is done, will be a test center for using video in computer instruction.*

f) *Doheny Library, containing prototype collaborative workrooms for software production.*

Each of these sites is a place to test the concepts of the Teaching Library on a small scale, for example, to learn how to combine the skills of library and academic computing personnel into a multidisciplinary staff. Even more important, these are centers for creating the software and services now, so that students and faculty will be ready to use the Teaching Library when it opens with fully developed and equipped facilities.

THE TEACHING LIBRARY FACILITIES

The Teaching Library will be the campus focus for the Center's support of information technologies in learning; "learning" implies both teaching and research, since new technologies encourage end-users to create or find their own information, and the tools to turn information into knowledge. As a catalyst to bring information technologies into the classroom and the library, the Center will have three roles in the Teaching Library:

1. *Direct support for the creation and use of instructional software by faculty and librarians;*
2. *Collaboration with the library in the creation of new kinds of information services;*
3. *Influence on the use of technology in support of traditional library services.*

continued

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1. Direct support for the creation and use of instructional software by faculty and librarians;

   The Center for Scholarly Technology [9.0] will be the campus center for supporting faculty, librarians, and staff in designing, creating, and testing instructional and information-access software.

   The Computer Commons [8.0] will be the largest campus center for students to use information technologies in their individual studies [9.3], and to learn new skills through consultants [8.1] and online training materials [8.3]. The Computer Commons will also include special rooms for collaborative work using information technologies [8.2], recognizing that much creative work and learning is collaborative.

2. Collaboration with the library in the creation of new kinds of information services;

   The Teaching Library is a new kind of library, both in its intensive use of technology to create and support innovative library services as well as traditional library activities, and in the concept that it is a gateway to the library system as a whole. As a gateway, the Teaching Library will teach the USC community how to use all of the computing and library resources of the University, through library instructional services, network data services, and reference services.

   Library Instructional Services [5.0] will include high technology training rooms for teaching the library and technical skills necessary to use any library or any computing facility on campus. When configured as an auditorium, they will be the site of Library/Center-sponsored events focused upon the appropriate uses of technology in teaching and learning.

   Network Management/Data Services [11.0] will be a clearinghouse to provide Teaching Library users access to campus and national information resources, and provide campus network access to Teaching Library resources.

   Reference [4.0] will be the intellectual center of the Teaching Library, offering both traditional reference information and consulting and classes about the use of information technology in finding and using information. Reference will reflect the Center's high technology approach to library services, and the continuing strengths of the traditional library.

continued

3. Influence on the use of technology in support of traditional library services.

The Teaching Library is also a library with a collection and services to support undergraduate and graduate teaching; and it is a gateway to the research collections in Doheny and the specialized subject libraries where expert research help is available. The center will extend the number and kinds of formats within which information is stored and used. Thus, Course Reserves [3.0] will include audio and video tapes, CD-ROM, and computer based information, and Collections [7.0] will comprise software (including that developed by the Center), and video and audio tapes as well as books.

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GOALS and OBJECTIVES

The Campus Advisory Committee has approved, and the University Library adopted, the following statement of goals and objectives of the Teaching Library:

> The Teaching Library will train USC faculty and students to be advantaged and skilled participants in the emerging computer-based information infrastructure which will be the foundation of the knowledge based economy and society of the 21st Century.
>
> The conduct of business, industry, and the educational process will all change dramatically as the further impact of technology allows us to make fundamental changes in the way the United States competes in a world economy. New kinds of knowledge must be created, new skills aquired, and new support technology developed. A new kind of library will be their home in the 21st Century. The Teaching Library is the vehicle proposed for USC to achieve excellence in these domains.

GOALS

The Teaching Library will:

1. Provide a unique facility to inspire and train students and faculty to aquire information and knowledge from both traditional and very advanced information technology-based national and regional sources. The major access will be by highly interactive workstations with great emphasis on user friendly systems. They will form the core of the Teaching Library.

2. Provide a campus center for faculty and students where tools and technology for collaboration will be readily available for teaching and research.

continued

continued

3. Integrate traditional information sources with emerging learning and information technologies in a state-of-the-art facility that will serve the University community well into the 21st Century.

4. Provide a campus center for faculty and students using library materials and computer technology for teaching and learning. The Teaching Library will be a gateway to more extensive library services and collections at USC, and to other research libraries across the nation and around the world.

5. Offer campus training in information access and analysis, and the preparation of teaching materials using computer technologies and networks.

6. Extend an introduction to the use of information technologies in learning to USC alumni and other groups in the surrounding community.

OBJECTIVES

1. Select and provide access to a library collection in all appropriate formats -- print, video, and digital -- to support the objectives of graduate and undergraduate instruction, including a centralized course reserve reading collection for the University Park campus.

2. Establish a Center for Scholarly Technology in the Teaching Library to develop and make available technology to create unique collaborative capabilities; to facilitate easy and timely access to major U.S. sources of information and knowledge; and to encourage the rapid electronic publication of scholarly work. The Center will also furnish a unique new interface capability allowing ease of use and amplification of human intelligence capabilities. It will also make available basic technology for the enhancement of the process of learning in the context of highly collaborative research and teaching efforts.

continued

continued

3. Define the programs of the new Teaching Library, integrating traditional library services with those of the Center for Scholarly Technology in a manner that provides a gateway to the resources of both specialized disciplinary libraries and academic computing services at USC.

4. Design a physical environment and computer-based facility to encourage group learning and study occasioned by interactive learning technologies.

5. Provide faculty and student exposure to a wide range of technology-based facilities which will be part of a national transition: to on-line interactive access to national and local electronic libraries, and to information and knowledge sources key to the U.S. movement towards computerized invention and commerce.

6. Organize groups of faculty, librarians, technicians and students (while the building is being built) to develop software for research and instruction, and test these prototypes in the Library Satellites and other sites.

7. Select and train a multidisciplinary staff (librarians, computer experts, instructional design specialists, etc.) oriented toward supporting and enhancing a technology-intensive learning culture, familiar with technical change, and comfortable with the process of innovation.

WORKING ASSUMPTIONS

The Working Draft of the Program of the Teaching Library which follows is based upon the following general working assumptions which form a bridge between the goals and objectives stated above and the spaces and programs defined below. In the next phase, many of these general working assumptions will be developed into working papers to define the organization, services, and operational policies of the Teaching Library.

1. The relationship of the Teaching Library to the library system as a whole.

   The Teaching Library will support immediate course related needs of students and be a gateway to the research collections in the Central Library System. Students will come to the Teaching Library to access information, technologies, services or training not available elsewhere.

   It will meet course-related needs of students through course reserves, through training in bibliographic instruction and computer-based information skills, through the provision of multi-media teaching materials, through individual and collaborative study spaces, and through a foundation collection of no less than 120,000 volumes.

2. Collections

   The Teaching Library will house a traditional library collection of no less than 120,000 volumes of monographs and journals that provide a foundation for study in a variety of academic disciplines.

   Reference holdings in the Teaching Library will focus on helping users acquire the information background requisite to doing basic library research and to assist in the completion of basic class assignments.

3. Course Reserves

   The Teaching Library will provide class reserve services for undergraduate and graduate students.

4. Online Information Resources

   USCInfo Workstations throughout the Teaching Library, and in the Computer Commons, will provice public access to library bibliographic and catalog databases and other on-line information and messaging services (i.e., campus

continued

information services, bulletin boards, etc.) as they are developed. Some USCInfo workstations will be configured to support catalog "lookup" functions only, while others will support more intensive research functions such as downloading and creation of personalized bibliographies and databases. Some USCInfo workstations will be configured to become general purpose workstations during non-peak hours. USCInfo services and workstations will be available in all campus libraries.

5. Training facilities

The Teaching Library will be the center for campus training in library skills, including both online bibliographic database searching and information access and analysis using computer technologies and networks. Librarians from across the library system will teach there, and facilities will be present for faculty to create teaching materials and work with students directly.

6. Computer facilities.

Training facilities will be designed as partitioned clusters of 25 workstations, which can be opened into a larger auditorium space for group demonstrations. At least 150 workstations will be available for students to use in the Computer Commons, with consulting help nearby. Eighteen small rooms in the Computer Commons will be configured with technologies for collaborative projects and group study.

7. Instructional Software Development

The Teaching Library will provide facilities and personnel to support the faculty, librarians, and graduate students in the creation of digital teaching materials. It will provide space, equipment, and programming support for the creation of instructional software and other digital teaching materials, lab space for experimentation with the use of advanced technology and software in instruction, and a software library with digital teaching materials (texts, databases, software, etc) to supplement traditional teaching media.

continued

8. Study spaces.

Besides the traditional library carrel and study tables, the Teaching Library's study spaces will be designed to provide technologies, information, and support services not available in the other spaces used by students for study. Group study spaces will be provided, some with computer technology designed for group work, others with audio-visual equipment for group viewing and discussion.

9. Design for 24 hour service.

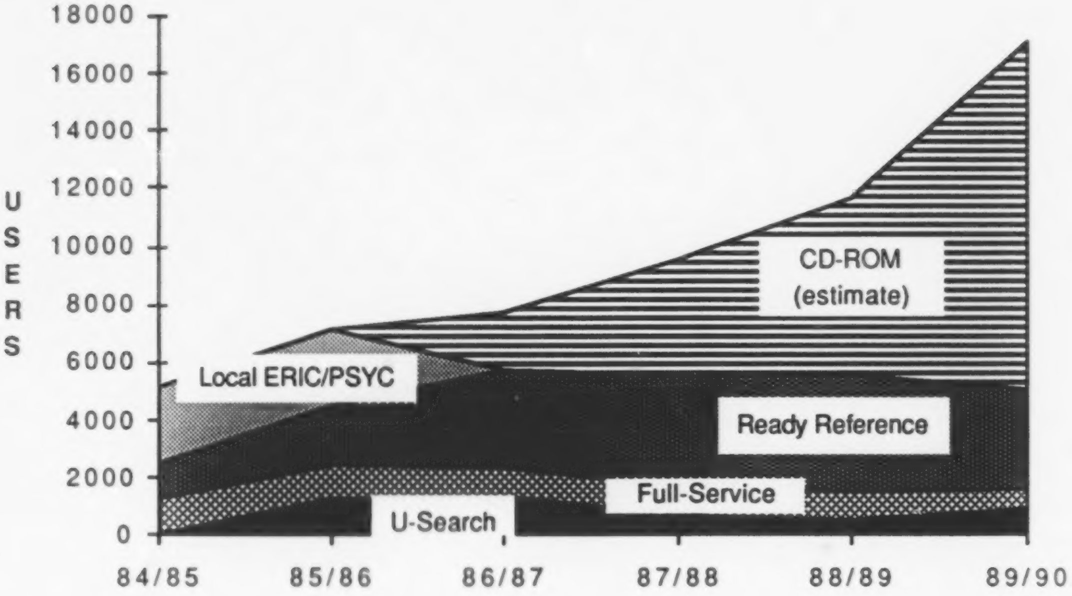
The Teaching Library will be designed to provide an option for 24 hour service in certain key areas.

CIS Highlights 1989/90
University of Texas at Austin

Key Statistics (General Libraries totals)

	1988/89	1989/90	% Change
USERS			
Full-Service	1011	604	- 40 %
Ready Reference	4070	3537	- 13 %
U-Search	521	977	+ 88 %
TOTAL USERS	5602	5118	- 9 %
SEARCHES			
Full-Service	1663	1104	- 34 %
Ready Reference	4540	4203	- 7 %
U-Search	975	1742	+ 79 %
TOTAL ONLINE SEARCHES	7178	7049	- 2 %

Trends in Use of Services



This chart, covering the past 6 years, shows the replacement of the locally mounted tape service with CD-ROM; subsequent growth in the number of CD-ROM databases; growth and leveling-off of Ready Reference searching; decline in Full-Service searching; and this year's near-doubling of U-Search usage.

Usage study

The following table shows our most searched databases, based on a three-month sample. Rankings are based on the number of total searches and are compared to a similar sample taken last year. Note that most of this sample was taken before the Engineering Library acquired NTIS and COMPENDEX on CDROM.

** RANK ** 88/89	89/90	DATABASE	FULL-SVC SEARCHES	READY REF SEARCHES	U-SEARCH SEARCHES	TOTAL SEARCHES
3	**1**	NTIS	44	472	108	**624**
4	**2**	INSPEC	48	440	80	**568**
1	**3**	Chemical Abstracts	136	220	208	**564**
2	**4**	COMPENDEX (Engineering Index)	100	292	124	**516**
7	**5**	Scisearch	148	212	0	**360**
10	**6**	RLIN	0	276	0	**276**
13	**7**	Dissertation Abstracts Online	32	88	124	**244**
8	**8**	Biosis Previews	16	80	140	**236**
6	**9**	GeoRef	8	220	0	**228**
5	**10**	MEDLINE	80	80	44	**204**

Another important measure of usage, shown in the following table, is the departmental affiliation of Full-Service search users. These data, based on the same three-month sample, reflect the general decline in Full-Service usage.

DEPARTMENT	** USERS ** 88/89	89/90
"Other/Not Given"	60	**96**
Mechanical Engineering	136	**76**
Chemistry	184	**72**
Chemical Engineering	92	**32**
Nursing	48	**32**
Pharmacy	72	**28**
Civil Engineering	24	**20**
Electrical & Computer Engineering	12	**20**
Psychology	28	**20**
Architecture	0	**16**
Curriculum & Instruction	12	**16**
Home Economics	0	**16**

This year we also sampled data on the status of users of various CIS services:

STATUS	FULL-SERVICE[1]	U-SEARCH[2]	CDROMs[3]
Faculty	28 %	2 %	2 %
Graduate Students	39 %	74 %	63 %
Undergraduates	14 %	12 %	19 %
Staff	14 %	12 %	6 %
"Other/Not Given"	5 %	0 %	10 %

[1] Based on a 3-month sample.

[2] Based on a 1-month sample.

[3] Based on a 2-week sample in PCL, UGL, & Life Science, using voluntary questionnaires.

FACILITIES

Dartmouth College Information System

Technical Overview

by

Robert J. Brentrup
Project Director

Contents

Introduction	1	InfoSpeak	3
Applications	1	InfoSpeak Server Processes	3
Implementation Strategies	2	Modularity	4
Presentation-level Protocols	3	Class Library	4

Dartmouth College Information System

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June 5, 1990

Introduction

This document is a technical summary of the Dartmouth College Information System (DCIS) implementation efforts. It describes the overall design and the significant features of the top-level components. Other related documents expand on the design details of each component. System-wide implementation considerations are mentioned where appropriate.

The system's architecture is one of distributed client/server computing. Server programs, often running on mainframe computers, service search-and-retrieval requests generated by client programs running on user workstations. Dartmouth's campus-wide communications network, known as the Kiewit Network, provides transparent access between client and servers (see Figure 1). Each machine needs to be able to send and receive data over its own physical network connection and to address other computers. The network routers and gateways provide physical media interconnections, data buffering, and protocol translation. The net effect of different network segments is only the throughput of the connection. Remote network connections via a modem or the Internet are also available. Once connected, these behave identically to a local connection.

Applications

The software is partitioned into multiple client applications (a "Navigator" and multiple "viewers"). The Navigator application is the user's initial interface into the system. It accesses a directory database maintained on one of the network servers, listing data sources available to the system. The Navigator is programmed to locate the "database of databases" on its own. The Navigator assists users in locating data of interest. It also locates a file server that stores the latest production versions of the individual "viewer" applications. The Navigator can then assist in acquiring the proper copy of viewer software to actually work with the data (Figure 2).

A number of viewer applications exist, each specialized to work with some subset (perhaps only one) of the universe of available databases. This multiple-application architecture allows great flexibility in:

1. the addition of viewers and databases to the system
2. the construction of individual viewer applications
3. the minimum workstation hardware requirements

Making a new data source and its viewer public is a matter of adding them to the "database of

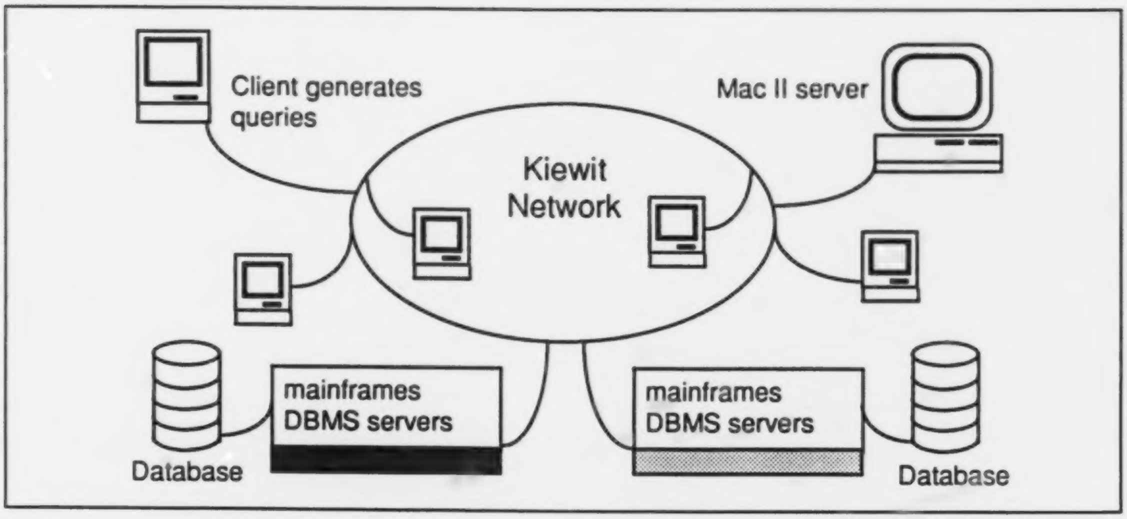

Figure 1. Network Computing

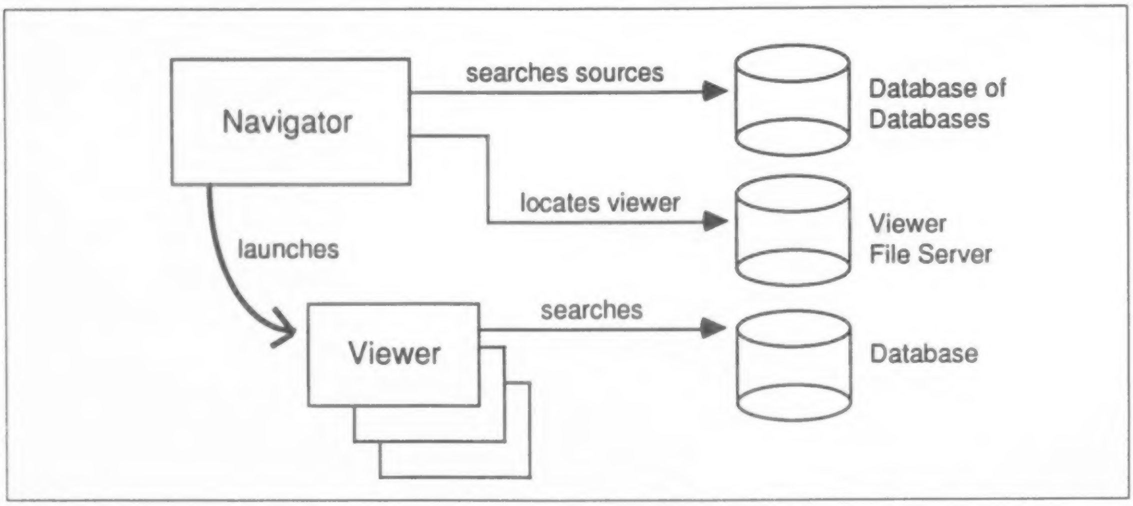

Figure 2. Workstation Applications

databases," putting the viewer in the distribution directory, and installing the database server. Any viewer is itself a stand-alone workstation application. The Navigator starts the appropriate viewer application and passes the necessary configuration information to it. A viewer may be started independent of the Navigator once the user has a local copy, by-passing the Navigator if desired. On the Macintosh® computer, the Navigator can launch the viewer either as another MultiFinder application or in place of itself on a Finder-only system, accommodating the capacity of older and/or smaller models.

Implementation Strategies

To maximize portability of the system and its individual components, a variety of technical tools have been employed. The components are designed and implemented in a modular style, anticipating interchangeable components in a number of places. The interchange of components adapts the system to differing network, computer, and database installations with a minimum of rework and duplication of effort.

The communication architecture is based on the widely used OSI model. The structure is often communicated using protocol-stack diagrams, as in Figure 3. A software protocol stack is a part of both the client and server applications. Any layer in the stack can be replaced by an equivalent layer having the same interface — without affecting code in the higher layers. This allows for a wide variety of actual implementations by recombining different sets of components. Figure 3 lists the generic functions of the layers. For example, at the Stream Protocol layer, the existing DCIS applications dynamically switch between Kiewit Stream Protocol (KSP) and Transmission Control Protocol/Internet Protocol (TCP/IP) protocols, depending on the network attachment of the workstation.

The Presentation, Session, and Transport layers provide functions of which the current applications are actually aware. Lower layers are completely transparent. Figure 4 lists the existing components in their respective layer locations. Some components in the protocol stack have been implemented elsewhere; for example, Sun's eXternal Data Representation (XDR), and TCP/IP. The system has been assembled taking into consideration already-existing components from various sources. The project development uses existing work where it is appropriate.

At the present time, a number of components are actively being considered. These are listed in Figure 5, again in their respective layer locations.

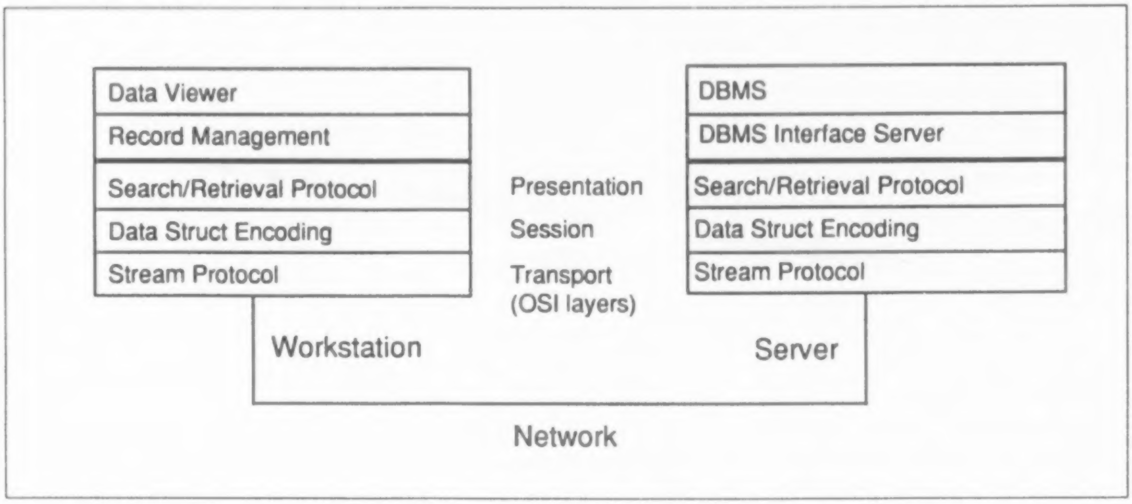
Data Viewer
Record Management
Search/Retrieval Protocol
Data Struct Encoding
Stream Protocol
Presentation
Session
Transport
(OSI layers)
DBMS
DBMS Interface Server
Search/Retrieval Protocol
Data Struct Encoding
Stream Protocol
Workstation
Server
Network

Figure 3. Communication Protocol Stack

Presentation-level Protocols

A number of interesting developments are occurring in the area of Presentation-level protocols. Apple Computer, Inc., has recently made the CL/1 package available. This package provides access to a number of different Structured Query Language (SQL)-type databases. At present, none of these database managers is in daily use at Dartmouth, although some evaluation is under way. Use of CL/1 databases should be a straightforward activity for further development by the DCIS project.

Some international standards are emerging in the area of search-and-retrieval protocols, namely, the National Standards Organization's (NISO) Z39.50 and the International Standards Organization's (ISO) SR. This sort of standardization should allow similar access over the Internet to databases at other institutions, in a similar way to the developments at Dartmouth College. The DCIS project is participating in efforts to develop implementations of Z39.50 to support such interchanges.

InfoSpeak

InfoSpeak is a transaction-oriented Presentation level protocol (OSI level 6), designed to facilitate access to heterogeneous information resources. It was developed as part of the DCIS project and was

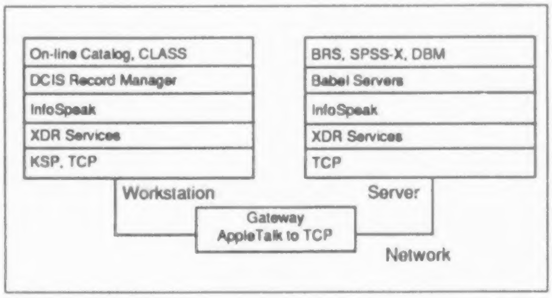
On-line Catalog, CLASS
DCIS Record Manager
InfoSpeak
XDR Services
KSP, TCP
BRS, SPSS-X, DBM
Babel Servers
InfoSpeak
XDR Services
TCP
Workstation
Server
Gateway
AppleTalk to TCP
Network

Figure 4. Existing Components

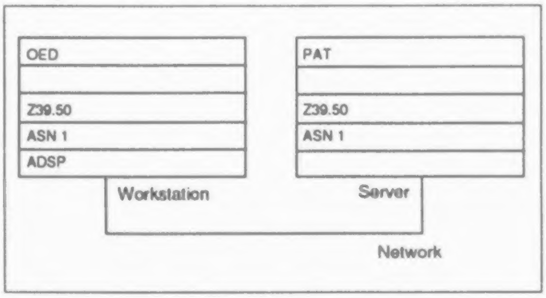
OED
Z39.50
ASN 1
ADSP
PAT
Z39.50
ASN 1
Workstation
Server
Network

Figure 5. Planned Components

started before specifications for Z39.50 were available. InfoSpeak was intended to standardize the local interface to data resources. It is a working implementation of ideas similar to those found in Z39.50. The project developers are investigating the issues of compatibility and interoperation with the new standards.

InfoSpeak accesses heterogeneous information resources by providing a client application with a homogeneous interface to various database servers. The client, using the homogeneous interface, makes requests for various primitive actions to occur at a server. The server is responsible for converting the requested primitive to a format suitable to the database management system (DBMS; an information resource). The action is executed, and the response is sent to the client. The response may have multiple parts or may be an error response, indicating a fault with the DBMS.

InfoSpeak is currently implemented atop XDR (a Session-level protocol), atop a reliable datastream protocol (TCP/IP or KSP/AT — Transport-level protocols).

InfoSpeak Server Processes

An InfoSpeak server is a network-visible entity that accepts InfoSpeak transactions on behalf of a DBMS. The server translates from the InfoSpeak protocol to the DBMS-specific form, and invokes the DBMS for the primitive. The server converts the DBMS output to the operation into InfoSpeak and sends that output back to the client. A C-code library implementing both client and server sides of the protocol has been developed. The server portion has been adapted to several different database management systems running on different host computers and operating systems. Additional versions will be implemented as needed.

On the Macintosh, an InfoSpeak object-code library has been compiled and is linked into the different viewer applications. An effort to convert this package to a Macintosh driver is planned; this would allow multiple clients to share the code at runtime. It should also make possible a *HyperCard* interface via some simple XCMDs that access the driver.

Modularity

A variety of internal modules are implemented in general ways, which allows them to be reused in several applications. For example, both a result-set Record Manager and a display-formatting package are being built, which can be used in other viewers.

The programming language C++ is being used in new software development to enhance the reusability and modularity of components. C++ is available on a variety of workstation computers, and it provides language features implementing object-oriented programming techniques. For example, C++ provides several levels of data-visibility control on an object. The inheritance features allow a programmer to create new objects based on existing ones, while modifying the object's behavior to suit a new task.

Class Library

The class library used to implement new viewers will be made available. This tool set will provide a low-resistance path to implementing additional viewers. By sharing this resource, the viewers ought to contain similar user interface conventions beyond those suggested by the Macintosh Guidelines. This aspect will help lower learning barriers.

The class library is under construction at this time. More details will be subsequently available. The class library will include classes such as:

- Application Class — which handles Event Handling and Dispatching, Disk Events, and Multi-Tasking
- Window Classes — which provide user interface portability, having subclasses of Documents, Dialogs, and Controls
- Object Drawing
- Device Interface
- Record Management

A Generic Viewer based on this class library will be available. This application is intended to be a general search-and-retrieval viewer for textual databases. The Generic Viewer should also be a sample application to use as a base for implementing more specialized viewers.

Dartmouth College Information System

Guidelines for DCIS Proposals

The Proposal Process

This document outlines guidelines developed for those individuals or groups at Dartmouth College who are interested in submitting project proposals for inclusion in the Dartmouth College Information System project (DCIS). Many projects are possible, however, resources are finite; an evaluation process is necessary. The intent is to evaluate ideas consistently and to rate their relative values accurately.

The various DCIS management committees will assist in the development of proposals and in the evaluation process. The DCIS Faculty Committee, consisting of faculty representatives from the Arts and Sciences and Dartmouth's professional schools (the Amos Tuck School of Business Administration, the Thayer School of Engineering, and the Dartmouth Medical School), advises and shapes the direction of the project, with a view towards fulfilling the academic mission of the institution. The DCIS Technical Committee, consisting of computing and other technical advisors, contributes to the technological development of the project. The DCIS Working Committee, consisting of representatives from the Dartmouth College Library and Dartmouth Computing Services, provides project orientation and assistance with proposal development.

Content of Proposals

In a relatively short, written document, proposals should develop the ideas to a reasonable level of detail to allow the DCIS Working Committee to make a proper evaluation of the proposal. The proposal should include the following:

1. a description of the idea
2. a description of project's value to the Dartmouth community
3. an explanation of how the resource would be used and by whom
4. a description of the data resources required, including a description of who owns the data now; how long access to the data would be required or available; where the data will reside; whether the data is in machine-readable form; and whether the data is already in a database
5. a moderately detailed description of the steps a user would go through in a typical session (the DCIS Working Committee can help with this description)
6. a description of the desired results/outputs or interaction with existing systems
7. an explanation of the project's relationship to any previous work
8. an identification of the costs involved, especially for the purchase of large data sets
9. a listing of possible funding sources
10. a description of the plans for maintaining the system after its development
11. a description of the means to control access to sensitive data (if appropriate)

Evaluation of Proposals

The DCIS Working Committee will review these proposals, make recommendations regarding their technical feasibility, and assess their implementation costs. The following factors will be used to evaluate and compare proposals (these are *not* listed in any particular order of importance):

- priority given to data sources already available at Dartmouth
- size of the potential audience
- interesting technical content
- possibilities for entry into new areas
- synergy with current or planned projects
- technical difficulty of implementation
- host computer time and space requirements
- continuing maintenance needs
- possibilities for grant funding

The DCIS Working Committee will present their recommendations to the DCIS Faculty Committee for discussion and possible approval.

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June 7, 1990

Dartmouth College Information System

General Overview

by

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Dartmouth College Library

and

Lawrence M. Levine
Dartmouth Computing Services

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The Nature of DCIS	2	Data Sources	5
Advantages of the Structure	3		

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June 7, 1990

The Concept

Historically, the effectiveness of educational institutions has depended to a great extent on the quality and delivery of their information resources. In recent decades, the amount of information to be controlled and made accessible has burgeoned, and the pace of research and publication has made it essential to provide immediate access to the most recent information available. No longer is information stored only in books and printed journals on a library shelf, accessed by means of printed indexes, and delivered by mail in its original or photocopied form. Higher education depends increasingly on electronic indexing of materials, electronic storage of text and data in local and national databases, and delivery of information via local and nationwide networks. As new methods of storage and delivery become available, scholars and researchers have come to expect instant delivery of current information. Indeed, the twentieth century is often referred to as the "Information Age."

The Dartmouth College Information System

To provide state-of-the-art access to information resources for Dartmouth College, the Dartmouth College Library and Dartmouth Computing Services are developing the Dartmouth College Information System (DCIS). DCIS is an information navigation and retrieval tool, whose use will become second nature to the faculty, student body, and staff of Dartmouth College. DCIS gives immediate, free, and easy access to a wide variety of information through the user's workstation.

DCIS will include data from a variety of sources (see the annotated list of data sources on page 5 of this document). Sources include:

- reference materials, such as dictionaries and encyclopedias
- indexes to the Library's collections and the journal literature
- resources from the humanities, such as the Dante Project (which makes approximately sixty of the best-known commentaries about Dante's *Divina Commedia* available as a database)
- numeric databases, such as census reports
- graphic data, such as images of maps, molecules, or paintings
- administrative information, such as class lists and schedules
- Dartmouth resources, such as the College newspaper
- aural and video collections for the languages and performing arts

Sources of information external to Dartmouth College, such as national bibliographic retrieval services, services provided by other universities, and national bulletin boards will also be available, by means of "gateways," or connections to these remote services.

The project is a coordinated, campus-wide effort, intended to enhance the current activities of the Library, Dartmouth Computing Services, and the data producers and managers throughout the College. DCIS is a critical element in the written, long-term plan for Dartmouth's computing environment.

DCIS and the Educational Process

The Dartmouth College Information System will have a major impact on the educational process at Dartmouth. Resources that are presently available either not at all or with substantial effort can become integrated routinely into classroom exercises and research. It is hoped that the support that DCIS provides will inspire the creation of additional scholarly databases similar to the Dante Project.

DCIS will also add immeasurably to the value of a user's workstation: a student's or faculty member's investment in a workstation will yield not only a terminal and word processor, but also a powerful gateway to a variety of network services geared toward scholarly tasks and campus life. Scholarly impact will be gained through enhanced access to the review, retrieval, manipulation, and integration of information from diverse sources quickly and easily, and in some instances, automatically. Educational impact will come in part by allowing faculty to guide students to the same types of information used by faculty in scholarly pursuits; artificial and contrived uses of information will be reduced.

These capabilities will increase the expectations of personal computing equipment among the faculty, administration, and students. Dartmouth's long-range plan for computing calls for a standard or "baseline" workstation that will evolve in capabilities each year; DCIS will be a significant impetus for the evolution of the workstation environment.

A Perfect Setting

Dartmouth College is perfectly positioned for this project for several reasons.

First, a campus-wide network extends to nearly every office, classroom, and student residence hall room. This network is already used heavily for communication through electronic mail, for the sharing of data through network-based file servers, and for access to information by means of the Library Online Catalog and other campus databases.

Second, the campus computing environment is active, consistent, and pervasive. About eighty percent of all students and nearly all faculty own a workstation; computer use among students and faculty is high. (Most of these workstations are Macintosh® computers, but there are significant "pockets" of other workstations, especially "high-end" UNIX® machines.) Mainframe computing is currently available free of charge to the Dartmouth community.

Finally, Dartmouth's extensive network and complete workstation saturation are unique factors supporting the development of new communications and interface tools to make commonly desired information available electronically — on an institutional basis. While other institutions have considered projects like DCIS, they have all acknowledged the necessity of first networking the campus, placing workstations with the majority of faculty, students, and staff, and achieving a viable level of computer use — three steps that Dartmouth has definitely achieved. Further, Dartmouth maintains the expertise to nurture a project such as DCIS; Dartmouth is committed to its development and maintenance.

The Nature of DCIS

DCIS consists of three components: a user interface, databases, and a high-speed network.

The User Interface

The user interface, running on the user's workstation, is designed for non-technical individuals. A windowed, Macintosh-based interface provides consistent access to the various databases in the system. DCIS software is being developed in a modular style, making it possible to port the applications and tools to other environments, including to other institutions. Remote connections to information are transparent; users do not have to specify what machine or server they are accessing. Use of passwords is unnecessary except for access to off-campus databases that charge for their use, or for access to sensitive or restricted data.

A user needs to learn only a single access mechanism to reach the entire body of data. The user interface framework is flexible enough to support different databases with differing display requirements. The user interface supports several standard database types, including text and numeric data and bit-mapped graphics. Because the databases that are included provide widely varying capabilities and features, the user interface necessarily consists of a number of different modules, or "viewers," each accessing a particular group of analogous databases. All of the viewers follow the same standards and dialogue routines and have the same "look and feel," so that the user is not required to learn special procedures for each database type.

The user interface allows the following:

- Information retrieval — the ability to gain access to a wide range of information from a single workstation
- Output manipulation — the ability to format the retrieved information in a number of ways; to print it at a number of locations; to store it on magnetic media either centrally or at the user's workstation; and to send it to other users either electronically or on paper
- Specialized services — document delivery; the ability to order or reserve documents; the ability to store a search strategy for automatic weekly or monthly searching; and the ability to defer execution of a search until a later time

Databases

DCIS will accommodate all data providers, including those not affiliated with the Dartmouth Library or Dartmouth Computing Services. A substantial portion of DCIS development will involve the design of database creation and maintenance tools.

The High-speed Network

The workstations will use the existing Dartmouth network, known as the Kiewit Network, to establish a connection to the databases. The network is a high-speed, local-data network that extends to nearly all buildings on campus. All residence halls and academic and administrative offices have AppleTalk® outlets (over 6,800 total outlets).

Personal computers, central mainframe computers, file servers, print servers, and supporting equipment are all linked through the network. The central computers include seven Digital VAX/UNIX systems, four Digital VAX/VMS™ systems, a Honeywell Dartmouth College Time Sharing (DCTS) system, and an IBM® VM/CMS® system.

Advantages of the Structure

In the past, information resources such as the Library On-line Catalog have been mounted on central mainframe computers. For those resources, the user interface software resides on the same machine as the data itself, and the user must use some kind of terminal to log in to the specific machine, thereby reducing an expensive workstation to a simple terminal.

DCIS avoids many problems inherent in the mainframe model by distributing the databases to various machines, all connected to the network, and by allowing user interface software to reside on personal workstations, also connected to the network. The advantages of this concept are several:

1. Users need not be aware of which machine the data they are accessing resides on. No particular log-on process is necessary, except where confidential or expensive off-campus databases are being accessed.
2. The entire system is not dependent on the functioning of a single machine. Loss of one database does not mean loss of the entire system.
3. Although a standard user interface is available to all users, it will be possible to implement specialized user interface features that either take advantage of the features of a particular workstation or address the particular needs of certain databases. A music database, for example, will require features that cannot be provided by a standard ASCII terminal.
4. A variety of database management systems and operating systems can be used for the databases. Each database server can act independently of the others.
5. Growth can be incremental. As data becomes available, new database servers can be added as needed.
6. Alternative storage media can be explored. Until now, only magnetic disks have been used for data that is to be accessed over the network. For certain types of data, DCIS intends to involve other media, such as CD-ROM or laser disks, as appropriate.
7. Control of the data is distributed. Individual data suppliers can manage the maintenance of their own data. For example, a faculty member with data appropriate for a small group of students and colleagues can make the database available through DCIS; the staff of the *VOX* (Dartmouth's weekly newspaper) can be responsible for maintaining its own indexes; and the administrative computing group can be responsible for maintaining the student directory.

Management of DCIS

The Dartmouth Library and Dartmouth Computing Services are the leaders for this project. The Library has developed the On-line Catalog and several other text databases and plans to continue to acquire scholarly information resources in electronic form. The Library also possesses considerable expertise in structuring and presenting textual data for electronic access. The Library is already the source and keeper of many types of information that are available electronically over the network. Computing Services is the creator of the network and is the central support organization for computing at Dartmouth; as such, it has a vested interest in the development of these network services.

The Library and Computing Services have distinct roles in the development of DCIS. The Library serves as "information broker" to provide consistent access to information in the support of teaching and research and to avoid the haphazard purchase and development of such resources. In the electronic medium, as in the past with printed media, this management means selecting, procuring, and organizing the resources and managing the formatting and presentation of the data. Computing Services provides support for the development and maintenance of the campus network, provides facilities management resources for necessary hardware, and provides the necessary user services, as has been its traditional role.

The development of the user interface and database-server software is a cooperative effort between Dartmouth Computing Services and the Library. Individual databases other than scholarly resources, however, are expected to be developed and maintained by the keepers of the data; information about students, for example, would continue to be maintained by the administrative computing group.

Both Computing Services and the Library will provide strong user support; the success and ultimate assimilation of DCIS into campus life depends on providing service and assistance to the users and being receptive to their needs and desires. Efforts will include user documentation, training sessions, telephone "hot lines," suggestion boxes, and on-line consultation and bulletin boards.

Data Sources

The following list is a sample of the variety of information resources that either are being included in the Dartmouth College Information System or are being considered for inclusion in the future.

Existing Resources

Dartmouth Library On-line Catalog
- Books
- Abridged books
- Orders
- Serials
- DartMed (a subset of the MedLine biomedical journal literature)
- New Hampshire newspapers
- Data files (machine readable information)
- Encyclopedia (*1988 Academic American Encyclopedia* by Grolier)
- Playbill (theater programs)
- MESH (an index of the MedLine subject headings)
- Thespis (a folder-level listing of the theatrical information file in Dartmouth's Willams/Watson Collection)
- GMAJ (G major — a collection of sheet music)

Committed plans for the On-line Catalog
- *The American Heritage Dictionary* (Library)
- OIS index (a listing of instructional materials held by Dartmouth's Office of Instructional Services)
- Shakespeare plays in full text

Committed Resources

Social science databases
The Oxford English Dictionary

Other Possible Resources

Dartmouth Library
- Other reference works that become available (for example, a thesaurus, familiar quotations, topical encyclopedias, technical dictionaries, atlases, style manuals)
- MLA Bibliography
- Project Cork (an index to literature on alcoholism)
- Bowker Environment Abstracts
- Current Contents
- *Books in Print*
- CIS statistical abstracts (Congressional Information Service — index to government documents)
- Wilson indexes (*Readers' Guide*, etc.)
- CHOICE reviews in full text (book reviews)
- MRDF survey (an index to data files and programs available at Dartmouth)
- *The Whole Earth Catalog*
- Aural collections
  Languages
  Performing arts
- Video collections
- Photographic collections
  Index to Dartmouth's photo archives
  Scanned images from photo archives
- Circulation information (circulation status of items located in the Dartmouth On-line Catalog)
- Indexes to local special collections
  Correspondence of Robert Frost (index and full text)
  Indexes to manuscript collections
- Tables of contents of journals
- Remote services
  Public access to RLIN
  Gateway to on-line retrieval systems
  Direct connection to Interlibrary Loan services
  Direct connection to the Library's reserve system

Humanities Department
- Thesaurus Linguae Graecae
- Dante Project

Social Sciences Department
- ICPSR data

Registrar's Office
- Dartmouth College Directory

- Class lists (with photos)
- *HyperGrades* (a Macintosh grading program for the faculty)
- Prospectus of courses
- Other administrative databases

Instructional Resources

- Course reserve readings in full text
- Laboratory manuals
- Experimental data from lecture demonstrations
- Viewing/listening assignments

Dartmouth Campus Life

- College events calendar (athletic and cultural)
- Rental Housing listings
- Employment listings
- *Used Book Exchange* (an on-line mechanism for advertising the sale of used textbooks)
- Ride-sharing information
- Bulletin board
- College newspapers (*VOX* and *The Dartmouth*) — in full text with subject indexes
- Other campus news
- Career and Employment Services listings
- Menus at food-service facilities

Hood Museum Catalog

Internet News

Clarinet UPI News Feed

Electronic Publishing Venture (International Environmental Affairs)

Gateways to Remote Servers

Miscellaneous, Locally Developed Resources

- African Resources database
- Women's Studies database
- Text of the Dartmouth College president's speeches
- A "Dartmouth Almanac" — facts about Dartmouth and its history

Interactive Databases

- Book ordering through the Dartmouth Bookstore

September 1988

University of Pittsburgh
COMPUTING AND INFORMATION SYSTEMS

The Faculty Technology Evaluation and Consulting Center

81

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The Faculty TEC Center

The Faculty Technology Evaluation and Consulting Center, located in 110 Old Engineering Hall, provides a central location for faculty inquiries concerning academic computing at the University of Pittsburgh.

Over and above day-to-day problem solving support, Academic Computing staff members are available to work with faculty to give advice on projects, explore potential applications of small computer systems, and provide in-depth project support. Services provided include:

- Front-line faculty consulting user advocacy
- Project support
- Workstation software and hardware evaluation and review
- Demonstration of technology solutions to facilitate instruction and research
- Faculty, staff and student computer accounts maintenance

The strategy of the Faculty TEC Center is to provide a contact for faculty inquiries concerning technical and non-technical questions on academic computing at the University of Pittsburgh. Activities at the Faculty TEC Center focus on one-stop problem solving. Front-line consultants serve as initial contact points for questions. Problems that cannot be handled immediately by the front-line consultants are referred to the appropriate Academic Computing staff specialist for resolution. This process reduces the number of people a faculty member must deal with in order to get a problem solved, thus providing answers as quickly as possible.

Facilities and Services

For details about hardware and software in the Faculty TEC Center, consult the TEC Center Facilities list, available in the Center.

The Faculty TEC Center's facilities and services are designed to let faculty members examine, evaluate, and experiment with a growing variety of current computing hardware, software, and peripheral equipment.

The Faculty TEC Center combines technical expertise with the commitment of improving the quality of academic computing at the University. Day to day operation and front-line consulting is provided by members of the User Relations Group of Academic Computing.

In-depth project support and consulting on Faculty TEC Center software and hardware and its application to research and instruction are provided by members of the Faculty Consulting Group. Both groups work closely together and with the rest of the Academic Computing staff to provide high quality and effective faculty consulting and support.

The Faculty TEC Center features:

- ***Consulting***. One of the primary functions of the Faculty TEC Center -- along with hardware and software evaluation -- is consulting. For long-term projects, the Faculty TEC Center consulting staff offers in-depth advising. Faculty members who are beginning a teaching or research project undoubtedly recognize their own performance standards and their monetary limits for equipment expenditures. However, they may not know what computing technology is right for them and they may lack either the technical expertise or money to thoroughly evaluate the technology currently available.

  Faculty members with computing problems -- however large or small -- should contact the Faculty TEC Center. The Faculty TEC Center staff will answer faculty members' questions and will discuss their project needs with them. The staff is dedicated to providing in-depth, *consistent* support through all stages of a faculty member's project -- from initial planning through final production.

- ***Hardware Evaluation.*** The Faculty TEC Center showcases high-end PCs, workstations, and peripherals like text and image scanners, optical disk drives, and PostScript laser printers. The TEC Center periodically receives the latest models available from the top vendors for one to six month evaluation. Current machines include an Apple Macintosh II, an IBM PS 2 Model 80-111, and a Sun 3 60 workstation.
- ***Software Evaluation.*** The Faculty TEC Center maintains a **Software Evaluation Library** of over 500 software Macintosh and DOS-compatible PC software packages. Faculty members may borrow software for seven days by presenting a valid University ID. The Faculty TEC Center also administers a library of programs, including publishing software like Interleaf University Publishing Software, Adobe Illustrator, and Ventura Publisher, data base software like Oracle and Paradox, utility software for scanning text and images, and other programs like KMS HyperText, Kyoto Common Lisp (KCL), and Grant Manager.

  The Faculty TEC Center also maintains the **Site License Software Library** -- a collection of 12 microcomputer software packages of which all full-time University faculty and staff may obtain copies. See the *Site-Licensed Software* brochure (available in the computing labs) for more information.
- ***Networking and Distributed Computing Environments.*** The Faculty TEC Center's evaluation area demonstrates potential interconnectivity solutions for the Macintosh, DOS and OS 2, and UNIX operating systems, using hardware like Kinetic's FastPath bridge and Cayman Systems' GatorBox, and software like Apple's AppleShare, and Sun Microsystem's TOPS communications programs. The Faculty TEC Center also has programs available to support the TCP IP and DECNET fast file transfer and Telnet terminal emulation standards. The TEC Center networking solutions are consistent with the directions dictated by the campus ethernet network.
- ***Vendor Demonstrations and Seminars.*** The Faculty TEC Center invites vendors to demonstrate their equipment and to conduct question and answer sessions.
- ***Faculty, Staff, and Student Accounts.*** The Faculty TEC Center's *User Relations* staff maintains mainframe computer accounts for all users, helps to track and resolve accounting problems, trains all users on the Computer Accounts Program (CAP) and generates student accounts, and handles all special privilege resource requests.
- ***User Advocacy: A New Concept for Problem Solving.*** A user advocacy function is also provided through the Faculty TEC Center. The "user advocate" is a Systems Analyst on the professional technical staff of CIS Academic Computing assigned to assist faculty in reaching the appropriate expertise to solve the problem, and to follow-up with the faculty member to ensure that the interaction has been satisfactory. In a large research university like Pitt, the faculty represent an extremely wide range of interests and backgrounds, computing needs, and levels of knowledge about computing. To meet the computing needs of the faculty we have assembled a group of technical consultants, each specializing in an appropriate area of academic computing. In this environment, open and effective communication is critical. The user advocate's job is to monitor our interactions with the faculty, to help faculty find the right technical specialist, and to give faculty someone on the staff they can call on to help when problems arise and in situations in which it is not clear who they should call.

Projects

The Faculty TEC Center projects apply available technology to computing problems which are common to faculty members and researchers. Some recent projects demonstrate the scope of the Center's resources.

- ***System Evaluation***. A professor recently used the DEST PC Scan Plus to convert a typewritten manuscript to computer-usable text.
- ***Benchmarking and Comparisons***. Recently, a graduate student (with faculty sponsorship) from the University's Intelligent Systems Program used one of the Faculty TEC Center's high-end Apple Macintosh II systems to benchmark a version of LISP in order to gather data for publication. Others have used the PS/2 Model 80-111 and the AST premium 286 to satisfy similar needs. Moreover, several faculty have found it useful to run like software on different computers to compare the *feel* of the keyboards and to measure any differences in response time.
- ***Publishing***. The Faculty TEC Center has available two of the most powerful high-end publishing packages on the market, Interleaf University Publishing Software, which runs on the Sun 3/60 and MAC II workstations, and FrameMaker for the Sun 3/60. The Faculty TEC Center invites faculty members to bring projects that require the kind of power available in the Faculty TEC Center's evaluation area and to let the Faculty TEC Center's staff assist you in evaluating the potential applicability of these particular programs.
- ***Development***. Faculty members who have developed instructional software on less robust systems have used Faculty TEC Center high-end systems to ensure that their programs work consistently across a product line.

Projects such as these present the Faculty TEC Center staff and University faculty members with opportunities for valuable learning experiences. Moreover, as a central facility, the Faculty TEC Center can offer more complete, competent advice to others as a result of this on-going enrichment that we experience through faculty contact.

Hours and Reservations

The Faculty TEC Center
110 Old Engineering Hall

Monday - Friday
8:30 a.m. to 5:00 p.m.

Consulting
624-9356
624-9344 (after 5 p.m. and on weekends)

Computing accounts
924-9343

Reservations for on-site evaluations
624-9330

Faculty project support
624-9361

1. Introduction

1.1 What Is PittNet?

PittNet is the University of Pittsburgh computer communications network. This network connects computing devices in most buildings on all University campuses. The services available through this network are accessible from every connected computer without regard to its location.

A wide range of services is available through PittNet, ranging from timesharing access for terminals to file, print, and mail services for personal computers, workstations, and mainframes. This document presents the following information:

- *Services* available on PittNet
- *Tips* on how to select the right PittNet services
- *Procedures* to request attachment to PittNet
- *Forms* to use to make requests
- *Requirements* for the use of network services
- *Costs* associated with the use of network services
- *Pointers* to other sources of information that may be helpful

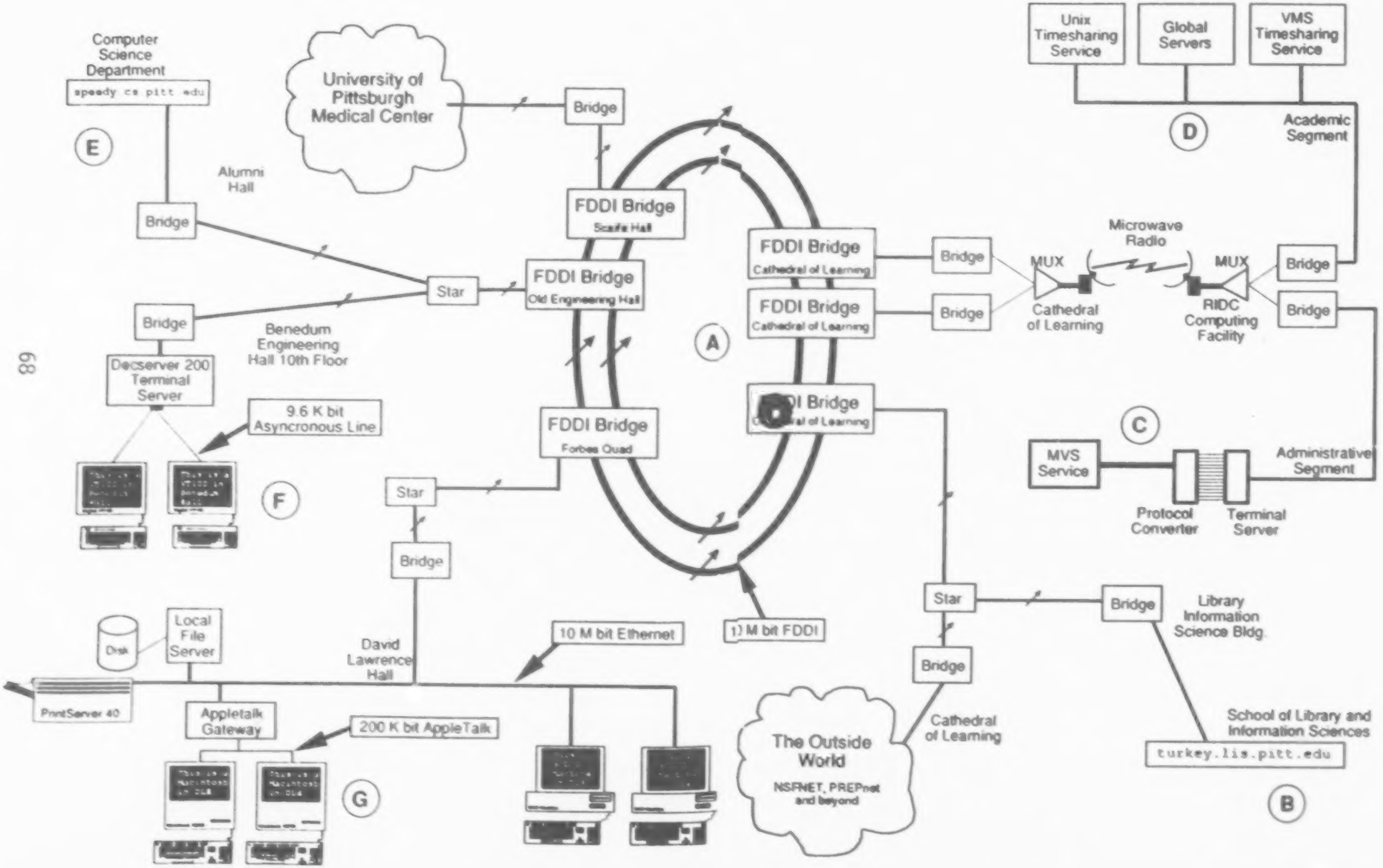
1.2 What Services Are Available on PittNet?

Chapter 2. Attachment Services explains the various methods of attaching to PittNet and the merits of each method. These attachment services include:

- Asynchronous attachment
- Ethernet attachment
- Appletalk gateway attachment
- Special assembly attachment
- FDDI + beyond — in planning stage

Chapters 3, 4, 5, and 6 present more detailed descriptions of each attachment service. In addition, information on other network services that are available to each type of attachment are presented. Examples are:

- *Terminal access* to PittNet hosts (computers offering network services)
- *Electronic mail* transmission and reception
- *File serving* for hosts, personal computers, and workstations
- *Printer serving* for hosts, personal computers, and workstations
- *Application serving* for hosts, personal computers, and workstations
- *X Window System access* to hosts and workstations
- *Software distribution and installation* for personal computers and workstations


Computer Science Department
speedy.cs.pitt.edu
E
Alumni Hall
Bridge
University of Pittsburgh Medical Center
Bridge
FDDI Bridge
Scaife Hall
Unix Timesharing Service
Global Servers
VMS Timesharing Service
D
Academic Segment
Star
FDDI Bridge
Old Engineering Hall
Bridge
Benedum Engineering Hall 10th Floor
Decserver 200 Terminal Server
9.6 K bit Asyncronous Line
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FDDI Bridge
Cathedral of Learning
Bridge
Bridge
Microwave Radio
MUX
MUX
Cathedral of Learning
RIDC Computing Facility
Bridge
Bridge
C
MVS Service
Protocol Converter
Terminal Server
Administrative Segment
FDDI Bridge
Forbes Quad
Star
Bridge
Disk
Local File Server
David Lawrence Hall
10 M bit Ethernet
10 M bit FDDI
PrintServer 40
Appletalk Gateway
200 K bit AppleTalk
G
Star
Bridge
Library Information Science Bldg.
Bridge
Cathedral of Learning
The Outside World
NSFNET, PREPnet and beyond
School of Library and Information Sciences
turkey.lis.pitt.edu
B

ACADEMIC COMPUTING

at the

University of Southern California

FALL 1990

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Welcome

Welcome to Academic Computing at the University of Southern California. This is the second edition of *Academic Computing*, published by University Computing Services (UCS) for the faculty, students and staff at USC. Many ideas and suggestions provided by the academic community have been incorporated. We hope that you will continue to help us improve this brochure by submitting your comments and suggestions to UCS, Mail Code 0251, Attn: Arlene Page or send electronic mail to *apage@skat.usc.edu*.

This brochure provides a brief overview of the academic computing facilities and services available at USC, as well as important information for all users, and gives details on where to go for further information.

We hope you will find the information in this brochure useful.

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Computer Ethics

In an academic computing environment, users' rights are a function of users' responsibilities. To violate the rights of others — be they colleagues, hardware or software manufacturers, or unidentified computer users — will lead to infringement of or sanctions against our rights as users. Respect for the property and rights of others will assure open and relatively unrestricted access for all.

The following statement on intellectual property rights was developed by the Software Initiative group within EDUCOM, a nonprofit consortium of colleges and universities committed to the use and management of information technology in higher education. It has been adopted by many academic institutions across the country and is supported by University Computing Services.

SOFTWARE AND INTELLECTUAL RIGHTS

Respect for intellectual labor and creativity is vital to academic discourse and enterprise. This principle applies to works of all authors and publishers in all media. It encompasses respect for the right to acknowledgment, right to privacy, and right to determine the form, manner, and terms of publication and distribution.

Because electronic information is volatile and easily reproduced, respect for the work and personal expression of others is especially critical in computer environments. Violations of authorial integrity, including plagiarism, invasion of privacy, unauthorized access, and trade secret and copyright violations, may be grounds for sanctions against members of the academic community.

Computer and network misconduct is viewed as a serious violation of academic values. Some acts of misconduct are specifically addressed by criminal and civil law. Members of the University community are expected to respect the rights and property of others and to understand that sanctions will be brought against those who fail to do so. Misconduct includes, but is not limited to:

- Copying proprietary (copyrighted) software
- Intentionally disrupting network traffic or crashing the network and connected systems
- Commercial or fraudulent use of University computing resources
- Theft of data, equipment, or intellectual property
- Unauthorized access of others' files
- Disruptive or destructive behavior in public user rooms
- Forgery of electronic mail messages

In a shared and distributed computing environment like that of USC, rights include fair and reasonable access and the right to privacy, but in turn demand respect for the intellectual and material property of all members of the University community.

Computer Systems at USC

Microcomputing

University Park Campus

The University provides both DOS-based (IBM or compatible) and Apple Macintosh microcomputers. The former consist of IBM PS/2 and HP ES12 models while the latter includes Macintosh II, SE/30 and SE models. Microcomputers are available in all but one UCS-operated public user room on the University Park campus. The exception is Salvatori 125. The largest number of microcomputers are found in King Hall room 200 and Waite Phillips Hall room B36. Laser printing is also available on a pay-per-page basis for both Macintosh and DOS computers. A Microcomputer consultant is located in Waite Phillips Hall seven days a week, at the hours listed below, and phone consulting is available for those users working at home or in their office.

A wide range of the most popular software packages are available in the primary user rooms and are supported by the Microcomputer Consulting Group. Because of the large number of software packages available for microcomputer systems, support is provided for only the most widely-used packages on campus. This allows more in-depth assistance to be made available to a larger number of users. The Microcomputer Consulting Group also provides assistance with software problems to those individuals who have legitimate personal ownership of specific software. If you own one or more of the software packages listed below and have questions, you are encouraged to call our Microcomputer hotline.

Many different kinds of software packages are available on the microcomputers in the public user rooms including word processing, spreadsheet, database, communications, and graphics. Each microcomputer in the user room is connected to a Local Area Network (LAN). The DOS computers are connected to a server which runs Novell network software, and the Macintosh computers connect to a server running Appleshare. This enables users to access the applications they need quickly and to print their documents on a laser printer.

The software programs supported by Microcomputer Consulting include:

Macintosh	DOS (IBM and clones)
Microsoft Word (v. 4.0 and up)	WordPerfect (v. 5.0 and up)
Microsoft Excel (v. 1.5 and up)	Microsoft Word (v. 4.0 and up)
SuperPaint (v. 2.0 and up)	WordStar (v. 5.5 and up)
NCSA Telnet (v. 2.2 and up)	Lotus 1-2-3 (v. 2.1)
tn 3270	dBase III plus (v. 3.0)
MacKermit	NCSA Telnet (v. 2.2 and up)
Mac OS (v. 6.03 and up)	Kermit (v. 3.01 and up)
	Procomm

In addition to consulting assistance, the Microcomputer Group offers hands-on workshops free of charge during the academic year. These 90-minute, one-time workshops give the novice user a chance to learn about the computers with a consultant present to answer questions. In addition to the introductory Macintosh and PC (DOS) workshops, segments on WordPerfect, Microsoft Word (for the Macintosh), Lotus 1-2-3, and Microsoft Excel (for the Macintosh) will be added. These courses will assume the user has a beginning knowledge of the computer, and will introduce them to a particular word processing or spreadsheet program. Priority is given to students, however if seats are available, faculty and staff are welcome to participate.

Classrooms are located in Waite Phillips Hall and Watt Hall, and are available for instructional use. For more information and guidelines for scheduling of these computer classrooms, please see the User Facilities section.

The Microcomputer Consulting group is located in the Jefferson Building, room 102A Users may call the consulting hotline, see a consultant in Waite Phillips Hall, or come to JEF 102A for assistance. It is suggested, however, that users call the hotline first, before coming to the JEF facility. The Microcomputer Consulting hotline number is 743-3235, and is staffed from 9:00 a.m. to 5:00 p.m. Monday through Friday. An answering machine is provided for calls after hours. Users are encouraged to leave a message and a consultant will return the call at the soonest opportunity. A consultant in Waite Phillips Hall is available for consulting, seven days a week; during the academic year Monday through Thursday from 10:00 a.m. until 8:00 p.m., and Friday through Sunday, from 10:00 a.m. until 6:00 p.m.

Health Sciences Campus

The Norris Medical Library on the Health Sciences Campus has microcomputer facilities available to all members of the USC community. These include a fully-equipped computer classroom and adjacent learning laboratory, which are open during library hours.

The library has 200 software programs, half of which are accessible through a Novell local area network. All of the stations have access to near-letter-quality printing. Laser printing is available at 10 cents per page via a debit card system. Machine time may be reserved at the library's loan desk.

The classroom consists of 20 IBM PC student stations and an instructor's station. All classroom stations are connected to the local area network and many have modems. The instructor's station is connected to a video projector to facilitate demonstrations. All stations have Enhanced Graphics monitors, and math co-processors. Faculty interested in using the classroom for group instruction should contact the library's Learning Resources Center (LRC) to make reservations.

The Microcomputer Lab consists of 16 IBMs and compatibles and five Macintosh stations. In addition, there are four IBM, one Apple IIe, and six Macintosh stations in the LRC. Users can utilize a wide selection of computer-assisted instructional materials including interactive video on laser disks. Users also may use the microcomputers for such applications as word processing, statistical analysis, authoring (for development of computer-based course materials), and database management.

The library has acquired software to support health sciences educational activities such as patient management simulations, patient interview simulations, and instruction in basic medical sciences. Anyone who has developed educational software is strongly encouraged to make a copy available in the library for use by others. Recommendations for commercially-developed software are encouraged.

For Health Sciences users, the library offers workshops on about 20 different topics covering computer literacy and information management skills. For further information about workshops contact the LRC.

A variety of information resources are available through the library's microcomputers. Through the library's LAN, all microcomputer stations have access to the university-wide Ethernet. This provides access to MEDLINE and other databases on USCInfo. In addition, selected stations have access to specialized databases including PDQ, Cancerlit, Health, DrugInfo, CINAHL (nursing and allied health information), AIDS CD Library, and Current Contents. Most of these are available through CD-ROM based systems.

Microcomputer consultants are available seven days a week including early evenings to assist users. Questions about use of the facility or available software should be directed to the LRC by calling 224-7409.

Mainframes / Workstations

Unix

Computers running the Unix operating system provide a powerful software development environment and access to mathematical and design software, simulation and document processing. The UCS Unix environment implements the latest ideas in distributed processing, employing many individual workstations in conjunction with larger, special purpose computers available over a high-speed network.

SunOS, a variant of Unix, runs on approximately 80 Sun workstations available in public areas throughout the campus. These are supported by five larger, more powerful Sun computers that provide shared file access for workstations and larger CPUs for compute-intensive tasks.

Typically, workstations are several times more powerful than personal computers and feature large high-resolution display screens. Another benefit of the workstation-based computing environment is that all resources of each workstation are available to its current user. In the traditional mainframe computer model, system resources are shared among all the users, often 60 or more at one time.

There are a total of 80 Sun workstations available in the public user rooms offering a wide variety of Sun architectures such as Sun SPARCStation 4/60, Sun SPARCStation SLC 4/20, Sun 3/60, and Sun 3/80. The basic specifications of each architecture follows.

> There are 5 Sun SPARCStation 4/60's and each has a SPARC CPU with built-in floating point processor, 8 megabytes of main memory, and is capable of executing 12 million instructions per second.
>
> There are 35 Sun SPARCStation SLC 4/20's and each has the same features of the 4/60.
>
> There are 10 Sun 3/60's and each has a Motorola 68020 CPU, Motorola 68881 floating point co-processor, 8 megabytes of main memory and is capable of performing 3 million instructions per second.
>
> There are 30 Sun 3/80's and each has a the features of the 3/60's except the 3/80's have a Motorola 68030 CPU.

Monochrome and color monitors are available in the user areas. Monochrome monitors display only black and white, whereas color monitors are capable of displaying 256 colors simultaneously from a palette of 16 million colors. Both the monochrome and color monitors can display an image which contains over 1 million picture elements (pixels) of information.

High resolution postscript and Xerox laser printers are available in the public user areas on a pay-per-page basis. Please see the section on User Facilities for further details.

In addition to workstations running Unix as an operating system, the Unix computing environment also includes larger, more powerful Sun computers that perform all functions associated with shared file access and timesharing.

Shared file access is provided by a Sun 4/490 which has a SPARC CPU with a built-in floating point processor, and 64 megabytes of main memory. It is capable of executing 22 million instructions per second and has a disk transfer rate of 3 megabytes per second. This computer allows each public workstation transparent access to approximately 16 gigabytes in the student disk pool.

Timesharing functions are provided by three Sun 3/280 and one Sun 4/490 computers. The Sun 3/280's each have a Motorola 68020 CPU and 32 megabytes of main memory. They are capable of performing 5 million instructions per second and have a disk transfer rate of 3 megabytes per second.

Each engineering student is automatically given a user account which enables access to these computers. Non-engineering students may request an account or obtain information by calling the UCS Machine Accounting Office at 743-3551.

The campus' Ethernet network provides fast access to remote machines and larger networks so that workstations can operate with greatly expanded storage memory and software. UCS can make applications available to almost any machine that is connected to this central network. These include a full repertoire of programming languages such as Common LISP, Prolog, Smalltalk, Pascal, Fortran, C and C++. Software libraries are available for complex numerical and symbolic math like IMSL, and many graphics programs are supported including GKS, DISSPLA and CORE. Display environments like SunView, X Windows, and NeWS allows users to create applications with advanced user interfaces. In addition to development tools, the University also has design software packages such as VersaCAD for drafting, SPICE for electronic circuit simulation, BRLCAD for three dimensional graphics and image processing, and MAGIC for the design of advanced integrated circuits. Sun computers also support the relational databases INGRES and SunUNIFY. Because most students and faculty are actively producing written material of various kinds, Unix systems also provide desktop publishing software like Framemaker, as well as facilities for typesetting theses in the University format or books having custom formats using TeX or Scribe. Framemaker allows users to combine images, text, and graphics into a single document. The output can be printed on one of the University's postscript laser printers. TeX and Scribe are non-interactive programs that can produce typeset output with complex math formulas, indexes and cross references. Sun workstations have programs that allow viewing TeX output to be previewed on the screen prior to printing.

Unix is a powerful and extensible system that will continue to improve and evolve in the years to come. The University strives to provide access to those latest systems as they become available. Current plans include using the IBM 3090 running AIX (a variant of Unix from IBM) as a file server which will be able to run applications that require a mini-supercomputer class machine. Also, USC is actively planning for software and hardware advancements for Sun systems like Sun's Open Look and products from the X consortium.

The Unix/VMS consulting group is in SAL 125. They support software and help solve system-related problems for the Unix operating systems. Their hours during the fall and spring semesters are Monday through Thursday 9am-9pm, Friday 9am-8pm, Saturday and Sunday 10am-7pm. They can also be contacted at 743-5935 or via e-mail. Software related questions should be directed to *consult@skat.usc.edu*, and system related questions/problems should be sent to *action@skat.usc.edu.*

VMS

Computers running VMS include the University's new VAX 6340, Gamera. Gamera has four central processors, each one capable of 4 million instructions per second, 128 megabytes of main memory and 16 gigabytes of disk space which can be shared with 13 VAXstation 2000 workstations in Vivian Hall and Science Hall via a DECnet "cluster." This allows the workstations to use Gamera to speed computations and provide more disk space and central software resources. The VMS systems share a new disk storage system based on optical disks. It has 64 WORM (write once, read many) laser disk platters. Each side of a platter holds 1 gigabyte for a total of 128 gigabytes—making it the largest single data storage on campus. The system has an automatic disk changing mechanism, from which the machine gets its name, "juke box".

Software for VMS computers include NASTRAN, a finite element analysis package which allows designers to "see" the mechanical stress on their designs before they've been made. REDUCE is an algebraic manipulation system for mathematical calculations that involve symbols rather than numbers. In the future SAS statistical software will be available.

VMS supports several programming languages: C, Fortran, Ada, Pascal, BLISS-11 and BASIC. The C and Fortran compilers have extensions to support parallel processing, which allows programs to use all of Gamera's CPUs at once. VAX/VMS Fortran is also well noted for its efficient use of computer resources and its many features for scientific data processing. Gamera is also the first USC computer to get a full Ada program development system. Gamera's Ada allows students to learn about the special requirements of such software. DISSPLA provides a high-level graphics interface for programmers, and DEC windows allows programs to display results on large color screens and use the mouse-based interfaces on workstations. IMSL math libraries are also available for VMS, as well as the Scribe and TeX document production and typesetting software.

VMS computers are connected to the Internet and BITnet. Accounts are available for engineering students, and other's needing VMS facilities.

Documentation for VMS and Unix systems is in Seaver Science Library (the reserve section) and in Salvatori 125. Consulting to help users with system-related questions and problems is offered 7 days a week in Salvatori 125. Classes are also offered at the beginning of each semester on important parts of the computer system software and applications. For more information on either consultation or classes, call the Unix/VMS consultant at 743-5935 or send e-mail. Software related questions should be directed to *consult@skat.usc.edu*, and system related questions/problems should be sent to *action@skat.usc.edu*.

IBM / MVS

The MVS operating system provides many general purpose, statistical and simulation packages and vector processing for numerically intensive computing. Currently, MVS runs on an IBM 3090 180E computer with 64 megabytes of main memory, another 128 megabytes of memory used to augment main memory, 2 gigabytes of paging memory, and 70 gigabytes of disk space. The 3090 180E runs at approximately 17 million instructions per second, and the vector processor has a theoretical maximum speed of 55 million floating point operations per second, which puts it in the low end of the supercomputer class.

The primary interactive system is the Time Sharing Option/Extended (TSO/E) Version 2. In addition, the Customer Information Control System (CICS) and Information Management System (IMS) are used for administrative computing. Under TSO, the preferred interface for the most users is the Interactive System Productivity Facility/Program Development Facility (ISPF/PDF) which provides a similar interface under many different computing environments, ranging from personal computers to the MVS operating system.

MVS has a robotic tape-mounting device attached to it that allows "near-line" data access very inexpensively. Over 7,000 tape cartridges (each holding up to 200 megabytes of data) is stored by the robotic arm and can be mounted on a tape drive within seconds of being requested.

MVS has several communication connections to outside computer systems. MVS is known as "USCMVSA" on the largest educational network, BITnet, which is connected to major educational institutions throughout the world. In addition, the Internet can be used to send and receive electronic mail to and from other educational institutions, commercial and government entities, and private networks. MVS is known as "MVSA.USC.EDU" on the Internet.

Many statistical packages are available for various measures and fields of study. The more well known packages are SAS, SPSSx, BMDP and Minitab. Also, the more esoteric packages such as Quail, Lisrel and SSA provide specific-purpose measures. Packages such as CADA, Minitab, SAS and Speakez provide interactive development environments with immediate feedback and editing capabilities that are beneficial for instructional purposes.

Text processing in a mainframe environment does not provide a "what you see is what you get" display. It does provide, however, very powerful processing options with a package called Script, which is useful for large document composition and analysis.

For programmers, the major languages available under MVS are Fortran, PL/I, Cobol, Pascal, C and Basic. Several subroutine libraries are available to provide extensive mathematical, statistical and numerical analysis routines. The Engineering and Scientific Subroutine Library (ESSL) and the International Math and Statistic Library (IMSL) both include subroutines that make use of the vector processor available on the 3090. The Harwell and Port subroutine packages are also available. The Argonne National Laboratories supplies special-purpose subroutines for solving eigenvalue problems, special functions in physics and nonlinear minimization.

Speakez, an interactive package has mathematical measures, time series analysis, some statistical measures, matrix algebra and financial functions. The Federal Reserve Board has developed several econometric and statistical Speakez commands that are also available. Speakez provides programming features, subroutine calls from outside, and has support for some graphic devices.

Data base packages, which can be used to organize large amounts of data into interrelated tables or to experiment with relational database technology are available. These packages include the Scientific Information Retrieval (SIR). There are also several accessible databases, including the 1980 census data, the Inter-University Consortium for Political and Social Research (ICPSR) data, and IRS data.

Several packages are available that support a variety of graphic devices for a visual representation of data such as SAS/GRAPH and CA/DISSPLA. Also available are CalComp and Tektronix subroutines to make use of the CalComp pen and electrostatic plotters and the Tektronix terminals and personal computers that emulate them.

The IBM 3090 mainframe and the robotic tape-mounting device are located in the UCC building. Consulting for the IBM mainframe users is located in Waite Phillips Hall (WPH) B34 from 10 a.m. to 8 p.m. Monday through Thursday and from 10 a.m. to 6 p.m. on Friday through Sunday. They can also be reached by phone at 743-7800.

IBM / VM

IBM's Virtual Machine (VM) operating system is a facility through which the user can develop any kind of a program that one might want to run on an IBM mainframe computer. The VM system can be used to develop an operating system, as IBM did. Moreover, it can address the more routine tasks of statistical analysis, bibliographic search, text processing, and computer networking.

Here at USC, the VM system runs on an IBM 3081 Processor Complex. The 3081 has 32 megabytes of central storage and has been rated at five million instructions per second (MIPS). The 3081 has access to over 70 gigabytes of disk space, about half of it dedicated to USCInfo, the University Library's database project. The 3081 can also access a robotic library of tape cartridges. Each tape cartridge holds about 200 megabytes, while the robotic library itself holds over 7,000 cartridges; thus, through the robotic library, the 3081 can access another one-trillion characters of "almost on-line" storage.

When users log on to the USCVM system, they access a "virtual machine." The concept behind the VM Control Program (CP) is to make it seem as though each user has complete control over the entire mainframe. Although many different and highly complex IBM operating systems can be run under VM, most users access only the Conversational Monitor System (CMS) to perform their work.

CMS provides a powerful, programmable editor (XEDIT), a simple set of commands to help users manage their files plus a programmable command language interpreter. The command language interpreter supports three different languages, the Restructured Extended Executor (REXX) language being the most recent and most powerful.

While CMS presents a relatively friendly interface, the user can also use IBM's Interactive System Productivity Facility (ISPF) and ISPF Program Development Facility (ISPF/PDF) when running CMS. ISPF/PDF provides a full-screen interface to VM and CMS, and provides the facility to develop full-screen interactive applications. If users are using both MVS/TSO and VM/CMS, they will find ISPF/PDF very helpful since it presents almost the same interface under CMS as it does under TSO. In addition, if the user has developed dialogs for ISPF/PDF under one system, they can easily be ported to the other system.

Programs can be written in the IBM System/370 assembler language and the higher-level languages that are available such PL/I, Fortran-77, Pascal, C, LISP, Prolog, MPSX/370, and SNOBOL. Compilers or interpreters for all of these languages are available. If the user writes his/her own programs, they can take advantage of the IMSL, NAg, EISPACK, and ESSL libraries of subroutines and functions.

There are many applications available on USCVM. To list just a few, there is the text formatting facility, Waterloo Script, and the SAS System for statistical analysis data. In addition to the base SAS System, also supported are SAS's graphics facility (SAS/GRAPH), full-screen facilities (SAS/FSP), interactive matrix language (SAS/IML), econometric and time-series analysis procedures (SAS/ETS), and operations research procedures (SAS/OR).

One of USCVM's primary applications is USCInfo. USCInfo is the Central Library's project for developing and maintaining large bibliographic research databases. For more information about USCInfo, please see the section on Central Library System.

Users of the USCVM system join a large community of computers networked with each other. USCVM is actually connected to two networks — BITnet and the Internet. BITnet is an international cooperative of about 3,000 systems in North America, Europe, the Near East, and Japan. BITnet uses standard IBM communications protocols, and is thus limited to electronic mail services, file transmission services, and a limited electronic conversation facility. The Internet is a very large network of literally tens of thousands of computers. Internet systems communicate using the TCP/IP protocols which provide a more robust set of services beyond BITnet's basic set.

In order to use the USCVM system, each individual must have a virtual machine assigned to them. Assignments are handled by the Machine Accounting Office of University Computing Services, located in the Jefferson Building. Their telephone number is 743-3551. USCInfo-only accounts are available from the Library.

Consultants are available in Waite Phillips Hall (WPH) B29, and can be reached by telephone at 743-7800.

Supercomputers

Both on- and off-campus supercomputing resources are available for USC faculty members and researchers.

San Diego Supercomputer Consortium

In addition to the many computer facilities on campus, USC is a member of the San Diego Supercomputer Consortium (SDSC), and as such has been granted a block of time to access a Cray Y-MP8/864 computer. This Cray is located on the campus of the University of California, San Diego (in La Jolla). USC maintains a VAX750 located in Powell Hall (PHE) as a Remote User Access Center (RUAC) to SDSC.

The Cray Y-MP8/864 is a computer with 8 processors, 64 megabytes of memory, 65 gigabytes of local disk, with about 35 gigabytes of disk storage and 1.3 terabytes of tape storage on the Common File System (CFS). The CFS is managed by an IBM 3081, and several VAX's provide 9-track tape and network services.

The SDSC Cray runs UNICOS, an operating system based on UNIX System V, and has gateways to Internet, BITnet, MFENET, and Tymnet.

Software packages include GAMS, HARWELL, IMSL, MATHLIB, MATLAB, NAG, OMNILIB, REDUCE, SLATEC, SMPAK, SPARSPAK, DISSPLA, DI3000, MOVIE.BYU, NCARGRAPHICS, TV80LIB, the X Window System, Alias, RenderMan, and Wavefront.

SDSC also has an Advanced Scientific Visualization Laboratory (ASVL) containing many different types of display hardware and software. The ASVL has both audio and video studios for recording and editing video tapes.

The USC block grant is 50 hours of CPU time per quarter and is administered by Dennis Smith, Director of Supercomputing at UCS.

Researchers needing 10 hours or less of time on the Cray should contact Mr. Smith (743-2957). Those needing more than 10 hours should apply directly to SDSC for their own allocation of time. Time granted by SDSC on the Cray is free, and allocation is based on the merit of the proposals submitted.

Alliant FX/80

The USC Alliant FX/80, named "hydra", is a multiprocessor computer with high speed array hardware.

Hydra has 8 advanced computational elements (ACE's) which are high speed computers implementing the instruction set of the MC68020. They support vector instructions able to do integer or floating point operations on up to 32 double-precision (64 bit) elements at one time in each ACE. Gather/Scatter instructions allows vector elements to be loaded or stored in arbitrary sequence.

Hydra also has 3 interactive processors which handle interrupts, terminals, disks, tapes, and network traffic. Hydra has 64 megabytes of main memory, 6 gigabytes of disk storage, and a tri-density 9-track tape drive. Hydra runs Alliant's Concentrix operating system, which is based on 4.3bsd Unix. Software packages includes IMSL, IGL, LINPAK, EISPAK, SPICE, MOVIE.BYU, GAUSIAN-86, BRLCAD, and DIGLIB.

IBM 3090/180VF

The USC IBM 3090 is a single processor 3090 with high speed array hardware. The 3090 VF (vector facility) has 16 vector registers and 171 vector instructions. Each vector register is 128 32-bit elements and the instructions do integer or floating point operations on up to 128 double-precision (64 bit) elements at one time. Indirect element selection allows vector elements to be loaded or stored in arbitrary sequence.

The 3090 runs IBM's MVS/XA operating system. Software packages include ALSCAL, BMDP, CALCOMP plotting routines, CSMP-III, DYNAMO-II, EISPACK2, EQS, FUNPACK2, GLIM, IGL, IMSL, KYST, LIMDEP, LISCOMP, LISREL, MAXSCAL, MINITAB, MINPACK, MPA, MULTISCALE-II, NT-SYS, POLYCON, QUAIL, RATE, RATS, SAS, SASPSS, SCA, SIMSCRIPT, SLAM, SPEAKEZ IV Epsilon, SPSSX, SPSSXSAS, SSA, and SUPPORT.

Networking at USC

University Computing Services maintains two distinct networks for the University community. The first network, based on Micom Systems hardware is used for asynchronous communication between users' terminals, microcomputers, workstations and larger minicomputers or mainframes. The second network, USCnet, is an Ethernet based network used to tie computers together for shared access.

Micom

As previously stated, the Micom network ties users to remote systems. These systems are typically in some geographically separate location. Due to the network architecture, the user doesn't need to know where the system is located because the network knows how to route the user calls to that system. There are approximately 100 computer systems tied to the Micom network, as well as several thousand user terminals and microcomputers.

The network is made up of 11 Data PABX's, each linked and each independent. Each switch is itself redundant, making a very robust network. Should any switch fail (as a result of a power failure, for example), the remaining switches will route traffic around the effected areas. The Micom equipment has another feature not usually found in other networks; it is not sensitive to the amount of data that is passed through it. Most other networks degrade as more data is pumped though them. The Micom network also gives you a clear data path between the user and the system, allowing the use of arbitrary character sequences and binary data. In other words, once the connection is made, the network becomes transparent to the user.

Dialup access is supported through the Micom network. Dialup service is maintained at 300, 1200, 2400 and 9600 baud, with MNP level 5 supported at 9600 baud. This allows University faculty, staff and students to work from remote locations such as their homes instead of having to be on campus.

USCnet

The Ethernet network, USCnet, is a high speed, multi-lingual (many protocols), multi-vendor based network that provides CPU to CPU services such as file system backup, shared file access, and shared printer access. Some of the protocols coexisting on the Ethernet include TCP/IP, DECNET, XNS, AppleTalk and LAT.

The network is a collection of cable segments, tied together with repeaters, bridges, routers and gateways. Because of the segmentation, local clusters of computers may have high speed access to each other with minimal effect on other segments. Should a segment fail for some reason, the overall integrity of the network is maintained due to the segmentation. Buildings are tied together via fiber optic cables. Internal to the building there may be traditional "thickwire" cable, "thinwire" cable, or twisted pair ethernet cable.

Fiber Distributed Data Interface (FDDI) rings are being implemented to improve connectivity and the speed of the Ethernet network. An FDDI ring runs at 100mbps (megabits per second), 10 times faster than the 10mbps Ethernet. The rings are "dual, counter rotating", giving them a natural resistance to failure.

External Access

Access to the outside world is provided via gateways that connect USC to many other universities and institutions. USC is a founding member of Los Nettos, a regional TCP/IP based network utilizing telephone company "High Cap" (generically known as T1) circuits. This network also connects to the NFS network which in turn is part of the Internet. The Internet spans the globe with connections to machines and networks throughout the world. Because of this connectivity, every device connected to the USC's Ethernet is actually an Internet member.

USC is also a BITnet hub for those requiring access to BITnet sites found at many institutions of higher education. BITnet is a store-and-forward network typically utilizing 9600 bps leased lines between sites. Each site has exactly one path between it and any other site on the network. Data passed though the network goes from site to site, each site storing the data then forwarding it. Each site discards the data after it has been forwarded to the next one.

Electronic mail is passed through and between all of our networks. Thus, a user on a system that is connected to a TCP/IP-based system can send mail to a user at a foreign host connected to BITnet just as easily as sending a message to a user on the same machine.

Gateways between the Micom network and the Ethernet exist for users utilizing machines that are not directly connected to the Micom network. Both TCP/IP's TELNET and DECnet's LAT protocols are supported by these gateways.

Electronic Mail

Electronic mail, commonly called "e-mail", is a computer-based system of transmitting messages to other computer users. These messages may contain text, computer programs, data, and in some sophisticated systems, even graphics.

E-mail is very useful for day-to-day communication that has traditionally been done by telephone, couriers, or the U.S. mail. Electronic mail provides a timely and convenient method of communication with individuals or groups, regardless of geographic location or simultaneous availability.

The electronic mail systems at USC vary from one host machine to another. A variety of e-mail software is available on all host platforms at USC, including IBM VM and MVS, VMS, and Unix. For more information, please pick up a copy of the document titled "Electronic Mail and Networking: A primer for the USC Community." It is available in the following public computer user rooms: SAL 125 and WPH B34.

Basic Mail Project

Because of the increasing demand for access to electronic mail, University Computing Services will establish a Unix-based "Basic Mail" service that will be available September 1, 1990. Basic Mail will provide two e-mail software programs, Elm and CMM, (two popular and well-supported e-mail packages), a Unix editor (Emacs), and access to national electronic bulletin boards. No other software will be available from Basic Mail accounts. In addition to enabling e-mail communication among members of the USC community, Basic Mail subscribers will gain full access to other universities connected to the Internet and/or BITnet.

The Basic Mail project is intended to provide members of the University community with an opportunity to learn about electronic mail. The service, therefore, will be free of charge for the duration of the academic year (until June 30, 1991). Those who have purchased Mizar mail-only or Totem accounts in the past will be able to access Basic Mail at no charge as well. The following year, a procedure will be in place to require unit-level authorization for Basic Mail accounts, and a minimal monthly charge will be billed directly to the units in a way that is similar to the current telephone billing procedure. (The actual charge will be determined once UCS can evaluate how many faculty and staff are interested in subscribing to the service.)

All faculty, students, and staff members are eligible for Basic Mail. The USC Basic Mail User's Manual, containing an account application form, general user information, and simple systems and software documentation, will be available for purchase at both the University Park and Health Sciences Campus Bookstores. In addition, Elm and CMM classes will be offered on demand throughout the year. Information on class schedules and sign-up will be included in the User Manual.

Services

Customer Service

Customer Services provides a central telephone number for users to report central systems problems and to request service. All associated calls should go through Customer Service including Health Sciences requests. This group is responsible for routing service requests to the appropriate support group. Hours of operation are from 8:00 am to 6:00 pm, Mon.- Fri. Customer Service can be reached by calling 743-8000.

Consulting

Consulting and support for the different computer systems is available by the respective consulting groups.

Microcomputers

The Microcomputer Consulting Group is located in the Jefferson Building, Room 102A. Consultants are also available in the public user room, WPH B34, Monday through Thursday 10am-8pm and Friday through Sunday 10am-6pm. In addition to assisting with questions about software in the user areas, they also handle software problems related to equipment owned by the user. Users can call the consulting hotline at 743-3235 with questions regarding supported software Monday through Friday 9am-5pm.

Unix/VMS

The Unix/VMS consultants are located in the user area of SAL 125, and are on hand to answer a wide range of questions. Hours of operation during the fall and spring semesters are Monday through Thursday 9am-9pm, Friday 9am-8pm, Saturday and Sunday 10am-7pm. The Unix/VMS consultants can be reached by phone at 743-5935. They can also be reached via e-mail; software related questions should be directed to *consult@skat.usc.edu*, and system related questions/problems should be sent to *action@skat.usc.edu*.

MVS/VM

Consulting for the MVS and VM users is located in Waite Phillips Hall (WPH) B34 Monday through Thursday 10am-8pm and Friday through Sunday 10am-6pm. on weekends. They can also be reached by phone at 743-7800 or by sending e-mail to *ibmcons@uscmvsa*.

Microcomputer Services

PC Service Center

The PC Service Center provides personal computer hardware support and repair. A wide variety of services are offered, such as depot carry-in repair service, on-site repair service,* warranty repair on selected manufacturer's products,** maintenance contracts, and hardware telephone support. The Personal Computer Service Center employs qualified and knowledgeable employees to provide services for the following equipment: IBM PC, XT, AT, and PS/2 personal computers, Unipaq personal computers, HP personal computers, IBM PC clones and compatibles, Apple Macintoshes, and a wide variety of peripherals. Hours of operation are from 10:30 am to 5:30 pm, Monday through Friday. The Service Center is located in University Computing Center, and can be reached by calling 743-3552.

System Support

The System Support group provides microcomputer system software and local area network support at both University Park and Health Sciences Campuses. Many services are offered, such as DOS and Macintosh operating system support, micro to mainframe connectivity, telephone support, and design and installation of Local Area Networks (Novell, D-Link, AppleShare, TOPS).

Service Charge Rate

For the more time-consuming and labor-intensive services, there are minimal charges, as listed below.

On-site repair service	$75.00 / hour
On-site software support	$75.00 / hour
Carry-in depot repair service	$55.00 / hour
Maintenance contracts	***
Telephone support	No charge

* Available to departments located on University Park and Health Science Campuses

** Apple Macintoshes, Unipaq Computers

*** Call 743-8000 for maintenance contract information

Center for Scholarly Technology

The Center, jointly sponsored by the University Library and Academic Computing is located on the second floor of Doheny Memorial Library. The Center's programs and services are designed to assist faculty in using technology and information/library resources for instruction and research. Working in cooperation with UCS and the University on a range of activities and projects, the Center's programmatic strategy is to accomplish these goals by:

1. supporting faculty in developing microcomputer and desktop computer software for instruction and research as well as other efforts that utilize technology to enhance teaching and scholarship;

2. supporting librarians in creating software for searching online information resources, primarily USCInfo;

3. conducting research and evaluation on the uses of computer technologies in teaching and scholarship, both at USC and nationally;

4. developing and evaluating prototype programs and facilities for the University's new Teaching Library (scheduled to open in 1993), and

5. supporting the efforts of individuals interested in enhancing their own expertise about technology and the overall technological expertise in the USC community, primarily by sponsoring the Microcomputer User Group (MUG).

Research and Evaluation

The Center is engaged in a number of research and evaluation projects addressing the impact of new technologies on scholarship and instruction, both at USC and nationally. For example, the Center, together with EDUCOM, a non-profit professional organization that promotes academic computing, is currently conducting a national survey of desktop computing. Supported by grants from 15 vendors, this national survey focuses on campus planning and policies affecting desktop computing in higher education. Other projects address implementation issues affecting campus efforts to use technology resources to enhance teaching and research. For further information on the Center's research activities, please call 743-3470.

USCInfo

In cooperation with the USC Library, the Center for Scholarly Technology is active in developing a graphical user interface for the USCInfo Campus Information System. This system, first installed in 1988, provides online access to 13 national periodical citation indexes, the Library's catalog, and campus information databases.

CST programming staff have taken the lead in developing the new Macintosh workstation-based interface for USCInfo. CST and librarians have participated in designing, testing, and implementing the USCInfo system and its improvements and also act as liaison to the University Library staff. This year, with CST technical assistance, the library will install over one hundred Macintosh SEs in campus libraries to provide access to USCInfo.

Further details on USCInfo can be found in the section for the USC Central Library System.

Software Consulting, Design, and Development

The Center's Software Development Group is located on the second floor of Doheny Memorial Library. Center staff are available to consult with faculty about software development issues (for example, design and interface questions) as well as the comparative advantages and disadvantages of different environments (for example, MS-DOS, OS/2, Macintosh, HyperCard, Unix, and NeXTStep) for developing instructional resources and software tools. For more information, please call 743-3323.

The Center's staff already has published two software packages that have attracted national attention. *The Jefferson Notebook* teaches students in USC's Freshman Writing Program and in other USC courses how to conduct library research for term papers and other projects. It allows users to log into USCInfo, search the database and download citations, annotate citations, and organize ideas on paper. Apple Computer has named the Jefferson Notebook as its standard HyperCard interface for instructional applications.

The *Bali Notebook*, developed by USC professors James Kremer and Steven Lansing and members of the CST staff, enables farmers on Bali to regulate their irrigation activities, thus bringing together the ecological awareness of traditional Balinese culture with state-of-the-art computer technology. The *Bali Notebook* has been the subject of articles in *Time* and the *San Francisco Chronicle*, as well as a special one-hour Public Broadcasting System (PBS) program, Nova. For more information about support for development activities, please call 743-3323.

Information About Technology Resources

The Center also facilitates communication between the USC community and vendors as part of an overall effort to introduce and support new technologies, provides information about technical developments which show promise for higher education, and seeks opportunities to pursue joint-development projects with selected corporate sponsors.

The Center sponsors the USC Microcomputer User Group (MUG), and its monthly publication, *Random Access*. Additionally, the Center sponsors an annual Fall Computer Fair. Finally, the Center sponsors speakers and conferences on advanced information technologies of interest to the higher education community.

Prototypes for the Teaching Library

A primary goal of the Center is to develop programs and resources to ensure that the new USC Teaching Library is a vital part of the campus community when it opens in 1993. Since 1986, the Library System has been engaged in small prototype development projects as part of a broader effort to identify and test new technologies which will be incorporated into the new Library. Two examples of these prototype projects are identified below.

a) The College Commons in Doheny Memorial Library has a prototype computer cluster where Center staff and the Freshman Writing Program have developed software to teach students how to do bibliographic research using USCInfo;

b) The Colonial Room in Doheny Memorial Library has been converted to a facility for group instruction;

These sites, and others, provide an opportunity to test concepts for the Teaching Library on a small scale.

USC Central Library System

The USC Central Library's online systems allow members of the USC community to search both the Library catalog and various citation indexes to periodical literature.

USCInfo

In cooperation with the Center for Scholarly Technology, the Library provides access to USCInfo, the USC Library's Campus Information Service. This system, first installed in 1988, includes online indexes to periodical literature, Homer, the USC Library catalog, and Campus Information files.

USCInfo is available at various library locations and computer facilities on both the University Park and Health Sciences campuses. In addition, USC faculty, staff and students can register at no charge for a personal UserID to use the system from a home or office computer. Applications are available at all library service desks. Applicants must be currently registered USC library patrons. Training classes will be offered through the academic year. For further information, inquire at library service desks.

Databases on USCInfo

Homer, the USC Online Catalog

Homer is an online listing by author, title, subject, and call number of all the books, audiovisual materials, microforms, and government documents added to the USC libraries since 1978. Many, but not all, works acquired before 1978 are also included. Homer does not include individual periodical articles.

Periodical Indexes Currently Available

Applied Science & Tech. Index	1983 to present
Art Index	1984 to present
Computer Database	1986 to present - includes abstracts
General Science Index	1984 to present
Humanities Index	1984 to present
Library Literature	1984 to present
Magazine Index	1983 to present
Management Contents	1986 to present - includes abstracts
MEDLINE	1980 to present - includes abstracts
National Newspaper Index	1981 to present
PsycINFO	1984 to present - includes abstracts
Social Sciences Index	1984 to present
Trade & Industry Index	1982 to present

Campus Information Files

The campus telephone directory will be available this fall, and other information databases will be added in the coming year. Possibilities include bookstore inventory information, events calendar, class schedules and additional periodical article indices. The library welcomes suggestions on possible information resources. Please send e-mail to LIBRARY@USCVM.

Computer Training

A wide variety of computer education classes are offered to the campus community. For further information, please call the specific group offering the classes you are interested in.

UCS Hands-On Seminars

Each semester UCS offers free, hands-on instruction to students, faculty, and staff in the areas listed below. Due to limited seating, all classes are offered on a first-come first-taught basis. No pre-registration is required. Schedules are available in the SAL 125 and WPH B34 user rooms.

Microcomputing

Introduction to the Macintosh
Introduction to MicroSoft Word (Macintosh)
Introduction to Excel (Macintosh)
Introduction to the IBM PC
Introduction to WordPerfect (IBM PC)
Introduction to Lotus 1-2-3 (IBM PC)

Priority is given to students, however if seats are available, faculty and staff are welcome to participate. For additional information, call the Microcomputer Consultants at 743-3235.

Unix/VMS

Introduction to the Vax/VMS Operating System
Introduction to the Unix Operating System
Introduction to the Emacs Editor
Introduction to the Sun Workstation Environment
Introduction to Mail Programs: CMM and Elm
Introduction to Debugging

Schedules and a brief description of these classes are available in SAL 125 and WPH B34, or can be displayed after logging on to a Unix or VMS computer by entering the following command: ***help classes***

For further information call the Unix/VMS Consultants at 743-5935.

IBM

Not all of the classes listed below are scheduled each semester. They can however, be scheduled if requested by a group of five or more users.

- Advanced CMS
- Advanced ISPF
- Advanced SAS
- Advanced TSO
- BMDP Part I
- BMDP Part II
- CMS Command Language (REXX)
- CMS Data Management
- Introduction to BMDPC
- Introduction to IBM Mainframes at UCS
- Introduction to JCL
- Introduction to MVS: TSO/ISPF
- Introduction to SAS/GRAPH
- Introduction to SAS/PC
- Introduction to VM/CMS
- Introduction to XEDIT
- MVS Command Language (CLISTS)
- MVS Data Management
- Mail on USCMVSA
- Mail on USCVM (USCMail)
- SAS Part I
- SAS Part II
- SAS Under CMS
- SCRIPT
- SCRIPT for Theses
- SPSS-PC+
- SPSSx Part I
- SPSSx Part II
- TSO/ISPF for Statistical Computing
- USCInfo
- Vectorization on the IBM 3090

Schedules are available to be picked up in SAL 125 and WPH B34. After logging on to the MVS computer, the schedule of classes can be obtained from the TSO command, ***classes*** and the TSO command, ***abstract*** will provide a brief description of each class.

Staff Computer Training Program

UCS provides microcomputer training to faculty and staff through the Staff Training Program. A new facility in the Doheny Library Colonial Room has been equipped with both Unipaq 386SX and Macintosh SE personal computers, Hewlett Packard Laserjet and Apple Laserwriter printers, and a Barco overhead projecter. Hands-on instruction in popular microcomputer software is provided by professional instructors from the Santa Ana office of ExecuTrain, a national training firm. ExecuTrain provides students with excellent manuals and practice diskettes which they may keep after the class.

Each one-day class is limited to 12 students so that instructors may provide the level of personal attention required for quality instruction. To ensure that each class of students is at approximately the same skill level, most topics are divided into beginning, intermediate and advanced sessions of one day each. It is not necessary to take a full sequence as long as you have the prerequisite skills for the course you wish to take. Courses currently available include:

IBM & Compatibles

Overview of Personal Computer Applications
DOS I & II
WordPerfect I, II & III
Microsoft Word I, II & III
Lotus 1-2-3 (Release 2.2) I, II & III
Lotus 1-2-3 (Release 3) I, II, III & IV (IV is a 2 day class)
Lotus 1-2-3 Release 3 for Release 2 users
Excel I, II & III
Quattro I & II
dBASE III Plus I, II & III (III is a 2 day class)
Paradox (2 day class)
Harvard Graphics
Microsoft Windows
Microsoft Word for Windows I & II

Macintosh

Macintosh Orientation: Desktop & Applications
Microsoft Word I & II
Excel I, II & III
PageMaker Skills (2 day class)
Introductory HyperCard Skills
FileMaker II (2 day class)

The charge for each course is $100/day, payable by requisition or personal check (tuition remission does not apply). If space permits, these courses are also available to students at the same rate and to alumni and employee family members for $125/day.

To register, request a schedule of classes, or obtain course descriptions, please call the UCS Staff Training Office at 743-3267.

Programming and Data Processing

Programming and Data Processing (PDP) is an academic program that was established to provide computer literacy courses to non-computer science majors. In addition to computer courses, the PDP program is characterized by its three modern computing facilities and a certificate program that is open to staff members and all individuals who are not seeking an academic degree.

Computer Literacy Courses

Over the past few years, the PDP Program has established an impressive track record in providing a wide range of computer courses covering topics such as computing concepts, computer hardware, application software, and programming. These courses are divided into standard academic courses and one-unit credit/non-credit courses.

Academic Courses:

PDP 101x	Introduction to Programming and Data Processing
PDP 102x	Introduction to BASIC Programming
PDP 103x	Introduction to FORTRAN Programming
PDP 104x	Introduction to COBOL Programming
PDP 105x	Introduction to Pascal Programming
PDP 110x	Introduction to C Programming
PDP 111x	Introduction to LISP Programming
PDP 225x	The UNIX System
PDP 250x	Microcomputer Applications

Credit/Non-credit Courses:

PDP 020x	Word Processing Using WordStar
PDP 021x	Word Processing Using WordPerfect
PDP 030x	Introduction to Lotus 1-2-3
PDP 031x	Introduction to Microsoft Excel
PDP 040x	Introduction to Ventura Publishing
PDP 041x	Introduction to PageMaker

Computing Facilities

The PDP Program currently has three microcomputer labs: two MS-DOS labs and one Macintosh lab (scheduled to open in the fall of 1990). A wide variety of software is available including word processing, electronic spreadsheets, database management, graphics, desktop publishing, and programming language compilers. The facilities are used for scheduled labs and are also available during special open lab times.

SBA 100	40 HP Vectra ES/12 microcomputers networked with Novell Netware, 2 HP LaserJet printers.
SAL 127	25 Everex 386 microcomputers, 12 HP Vectra ES/12 microcomputers, 2 HP LaserJet printers.
OHE 530K	40 Macintosh IIci microcomputers, several laser printers.

The Certificate Program

The PDP Certificate Program is open to staff members and all individuals who are not seeking an academic degree. Sixteen (16) units are required for the certificate. Eight (8) units must be earned by taking the two core courses: PDP 101x and PDP 250x. Students complete the certificate by taking eight (8) additional units of PDP courses. PDP advisors are available to help determine which courses to take.

The PDP Program's main office is located in Olin Hall (OHE) 412. If you have any questions, please drop by the main office or call 743-7237.

Instructional Television Network

The USC Instructional Television Network (ITVN) provides an alternative to the live courses offered by other programs. USC-ITVN utilizes videotaped courses from Learn-PC and MicroVideo Learning Systems. Each course consists of three to five lectures, workbooks and data diskettes. The courses are scheduled during the lunch hour and as an added convenience, lectures can be rescheduled if you are forced to miss a lecture due to illness or pressing University business. Costs range from $75 to $200 including all materials.

Currently, the courses include the most popular software applications for the IBM PC and compatibles. They are:

MS-DOS
Lotus 1-2-3 (version 2.0, 2.2 and 3.0)
WordPerfect (5.0 and 5.1)
PageMaker
dBASE III Plus
dBASE IV
Symphony
Introduction to Computer Literacy

For further information, schedule of classes or registration, please call Ray Fujioka at 743-0096.

Center for Scholarly Technology

A training program is now available to help faculty and graduate students use *ProCite*, a microcomputer database software program which helps researchers and scholars organize their personal research. Information about *ProCite* is available by calling 743-6761.

USC Central Library System

Classes are offered with topics to include general introduction to USCInfo, advanced searching techniques, and searching the MEDLINE database. For more information, please ask at the Doheny Reference Desk or call 743-2540.

Means of Information

The UCS Networker

The *UCS Networker* will be published every other month during the academic year by University Computing Services. It will be mailed to all subscribers on campus at no charge. *The UCS Networker* will also be available in the SAL 125 and WPH B34 public user rooms.

The objective of the *UCS Networker* is to provide a method of disseminating computer-related information to the USC community. It is not designed to be a "how to" reference, but to inform and educate the readers about the resources available, the trends and directions of USC academic computing, and the philosophy behind those decisions.

MUG

The USC Microcomputer User Group (MUG) was founded in 1986 as a support mechanism and forum for USC faculty, staff and students to share their knowledge of microcomputers. The main goal of the MUG is to disseminate information to the MUG members. Besides providing volunteer consultants on a variety of software and programming languages and sponsoring the USC Bulletin Board System (for information, see USCBBS), the MUG also publishes *Random Access*, an in-house newsletter which is mailed to all MUG members. The MUG also holds monthly meetings at USC. They are generally held the last Wednesday of every month, except July and December. The MUG Board of Directors arranges guest speakers to give demonstrations and informative presentations. These informal lunch-time meetings provide a valuable opportunity to acquaint oneself with recent computer developments and, more importantly, with fellow faculty, staff and students at all levels of computer expertise. Announcements of upcoming MUG meetings are advertised in the USC *Daily Trojan* newspaper, are sent to registered MUG members through the mail, and are noted in the USC Electronic Bulletin Board System.

Interested USC students, faculty and staff may join the USC Microcomputer User Group by picking up an application for membership at the USC Bookstore or at University Computing Services (Jefferson 100). MUG membership is free of charge.

Random Access

Random Access, The Newsletter of the USC Microcomputer User Group (MUG), is published ten times a year, and is written by the MUG members themselves. It provides current information on the latest computer hardware and software that might be of interest to the USC microcomputer community. Specific tips on software usage (such as WordPerfect, Lotus and dBASE), are also included. It outlines past and future MUG events and meetings, and highlights new computing developments on the USC campus. Perhaps the most popular feature in *Random Access* is a page of volunteer consultants, "Quick Consultants", all of whom are MUG members. Most consultants are on campus during the day, and are available for quick questions covering approximately 50 different software packages and programming languages. *Random Access* is mailed to each of the MUG members.

USCBBS

USCBBS is an electronic Bulletin Board System supported by the USC Microcomputer User Group with equipment and facilities provided by UCS. The BBS primarily serves as a forum for the exchange of information and ideas among the USC community - students, faculty, staff and alumni. There are five main functions that the BBS provides: electronic mail, interactive dialogues, public discussion boards, a library of public-domain computer software and a set of informational databases.

1. Electronic mail is a simple-to-use system to allow you to send to and receive messages from other BBS users.
2. Interactive dialogues can be initiated through the "Chat" mode, and the user may chat with only one individual, or choose to participate in an open forum with many others.
3. Public message boards allow one to post opinions, thoughts and other information on specific topics such as News, Philosophy, Religion, Cinema, Macintosh and IBM computers, just to name a few.
4. USCBBS has several hundred megabytes of public-domain and shareware software programs. An extensive collection of IBM and Apple computer programs exist, including games, graphics, communications, business and finance. A smaller, but growing collection for other systems (Amiga and Atari) is available also.
5. A selection of databases is maintained. They currently include a DINING database of restaurants in the L.A. area, databases sorted by name and date of the software library, and a database showing USCBBS users. Others are planned for the future.

There will be a nominal fee to cover the mailing and labor costs incurred in hardware, software maintenance and upgrades and other BBS operating expenses. All current members will be assessed this fee which will be implemented about January 1991.

User Facilities

On the University Park Campus, there are numerous facilities where students, faculty and staff may use microcomputers and Sun workstations. These facilities all have access to printers; some have connections to Micom and Ethernet lines for reaching UCS mainframe resources as well as resources on national networks. Equipment with priority access for disabled users is provided in the three primary user areas listed below.

University Computing Services operates three primary public user areas in Waite Phillips Hall room B34, King Olympic Hall room 200, and the Henry Salvatory Computer Center room 125 which are open twenty-four hours a day during the academic year. Other smaller facilities are also available in the Cinema School, the School of Urban and Regional Planning (University Gardens), Andrus Gerontology Center, and Watt Hall. There are also facilities operated by Doheny Library, the Law School, and the School of Business which are operated independently, and may have restrictions for their use. Information on all UCS supported user rooms can be found in the UCS Directory of User Areas, which is available in Waite Phillips Hall, King Hall and Salvatori Computer Center.

The primary user areas require a university identification card for entry. There is a charge for all laser printing in the public user rooms. USCard discretionary accounts are required for this purpose. There will be no cash or checks accepted for laser printing charges. Please see below for further details.

Computer classrooms are available on campus. The Waite Phillips Hall user area houses a classroom facility containing IBM PS/2 model 30s and model 50s with Micom and Ethernet access to USC mainframes, an instructor station and an ceiling-mounted projector. The Watt Hall user room can double as a classroom containing Macintosh II's with color monitors. Unix/VMS and IBM mainframe classes are held in both of these facilities. The Olin Hall room 122 lecture hall has a Hewlett Packard microcomputer connected to a full color video projector. This room can be used for lectures requiring computer and video aided instruction. It does not provide any capabilities for "hands-on" seminars. Faculty and staff members may secure time in any of these classrooms by calling classroom scheduling at 743-2136. Permission must be secured from University Computing Services before any non-supported software packages are installed.

In addition to user facilities operated and maintained by University Computing Services, many departments and schools throughout the campus have facilities to meet their special needs. Check with the administrative offices in your department to inquire about any of these special areas.

Printing Fees

Effective September 1, 1990, students, faculty, and staff will be charged directly for laser printing from all University Computing Services' facilities. This includes printing from the IBM/VM and MVS mainframe systems, the Unix and VMS systems, and the microcomputer systems in the Public User Rooms.

UCS has arranged for the USCard debit card to be the means of direct payment for printing in all its facilities. The USCard discretionary account used for this purpose is available to individual card holders as well as to academic and administrative units. Students will most likely use their individual USCard accounts, while departments have the option to determine how to distribute and manage direct charges for printing by faculty and staff with the USCard.

Please note that this procedure does not apply to those using other sources of direct funds (e.g., sponsored research or external funds) for mainframe computer accounts and printing. Print charges for these accounts will continue to be billed directly via an open requisition.

Although there are a number of different accounts available with the USCard, a discretionary account is necessary for UCS printing. The procedure for setting up a USCard discretionary account is as follows:

- The student, staff, or faculty member may go to the USCard office in the Commons to initiate an account with a minimum deposit of $20. The office hours are 8:30 am - 5:00 pm.
- Departmental cards may be acquired by submitting a blanket requisition to the USCard office in PSX. A special card will then be made and delivered to the department. If the department wishes to limit the use of the discretionary account to only UCS printing charges this may be done when the departmental card is issued.
- Card holders may then use their cards for UCS printing. Pages will be counted and the user's card debited before he or she can see the output. All USCard account transactions are recorded by the system reader.
- Prices will depend on the type of printing service. Current prices are posted in the user areas.
- Payroll deduction is also available and can be arranged with the USCard office.
- Cash and checks will not be accepted by UCS to pay for printing. Nor will UCS accept cash or checks to establish or replenish USCard accounts. This must be done at the USCard office.

Questions regarding the new policy of charging for printing or the procedure for acquiring a USCard discretionary account should be addressed to the UCS Facilities Administration Office at 743-4800.

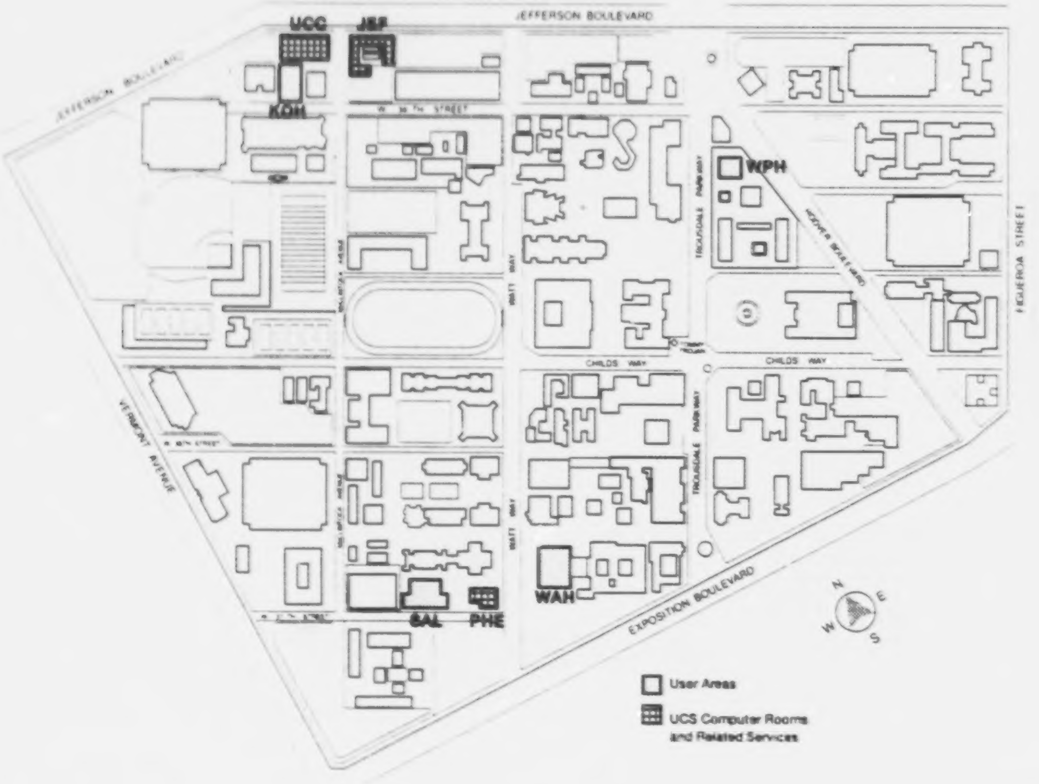
EduTech Computer Store

Computers are becoming increasingly important to students. Tasks that students face while in college such as word processing, graphic design, mathematics and engineering are all accomplished quickly and thoroughly with the aid of a computer. Fortunately, for USC students, EduTech offers competitive prices on hardware and software. Thus, the cost of a computer at the EduTech Computer Store is most likely to be significantly lower than off-campus stores for USC students, faculty and staff.

The EduTech Computer Store is located on the Third Floor of the new University Bookstore at 840 Childs Way on the University Park Campus. This facility sells Apple, IBM, Unipaq and Zenith computers, and software to meet every need by Microsoft, Lotus, Claris, Borland and Ashton-Tate. All items in the store are discounted significantly by the manufacturers, and the savings are passed to students, faculty and staff members of the University of Southern California only. Friends from other universities or relatives of University community members are not eligible for the EduTech special prices.

For further information please contact the EduTech Computer Store at 743-3154.

Public User Areas


JEFFERSON BOULEVARD
UCC
JEF
JEFFERSON BOULEVARD
KOH
W. 36TH STREET
WPH
TROUSDALE PARKWAY
HOOVER BOULEVARD
FIGUEROA STREET
McCLINTOCK AVENUE
WATT WAY
CHILDS WAY
CHILDS WAY
VERMONT AVENUE
WAH
SAL
PHE
EXPOSITION BOULEVARD
N
E
S
W
User Areas
UCS Computer Rooms and Related Services

Location	Equipment
KOH (x7172)	Macintosh II's Macintosh SE's Macintosh SE/30's HP ES12's IBM PS2
OHE 530k	Sun 3/50's
SAL (x0069)	Sun SLC's Sun 3/60's Sun 3/80's
WAH 7	Macintosh II's
WPH B36	IBM PS2 - 50z's IBM PS2 - 30-286's
WPH B34 (x0508)	Macintosh II's Macintosh SE's HP ES12

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Academic Computing Phone Numbers

	Current	New
Customer Service (Problem Reporting) 24 hr	743-8000	740-8000
UCC Receptionist	743-2957	740-2957
UCS Support		
MVS/VM Gen. Info & Consulting	743-7800	740-7800
Microcomputing Gen. Info & Consulting	743-3235	740-3235
Unix/VMS/Workstations Gen. Info & Consulting	743-5935	740-5935
User Account Set Up	743-3551	740-2969
Data Communications	743-8000	740-8000
Health Sciences Campus Computing Services	224-5493	342-2930
PC Repair Center	743-3552	740-7272
Electronic Mail Questions		
IBM mainframes	743-7800	740-7800
Unix/VMS	743-5935	740-5935
UCS Facilities		
Dial ups (Micom network)		
9600 Baud	743-2377	743-2377
2400 Baud	743-5000	743-5000
1200 Baud	743-8753	743-8753
300 Baud	743-7646	743-7646
User Areas		
King Olympic Hall, KOH 200	743-7172	740-7707
Waite Phillips Hall, WPH B34	743-2492	740-7953
Salvatori Computer Science, SAL 125	743-0069	740-4490
Computer Rooms		
Univ. Comp. Center	743-2957	740-2957
Print Distribution	743-5893	740-2851
Tape Library	743-8040	740-2831
Powell Hall of Engineering	743-2240	740-4141
Computer Training		
UCS Hands-On Seminars		
Microcomputing	743-3235	740-3235
Unix/VMS	743-5935	740-5935
IBM	743-7800	740-7800
Staff Computer Training Program	743-3267	740-2974
Program and Data Processing (PDP)	743-7237	740-4542
Instructional Television Network	743-0096	740-0119
Center for Scholarly Technology	743-6761	
USCInfo Accounts & Consulting	743-0950	
EduTech Computer Store	743-3154	740-7692
Microcomputer User Group (MUG)		
Information	743-6795	740-6240

University of Texas at Austin

Computer-based Information Services

Users of the General Libraries have access to a wide and increasing range of information services using computer technology. Most databases contain references to articles, reports, books, and other documents; some contain other information such as statistical data or the full text of articles. While much of this information is also available for searching in printed form, searching by computer is faster and more effective for complex topics or extensive files. In many cases, you have the choice of receiving the data as a printout or on floppy disk.

Services involving a charge

These search services are available to currently affiliated University of Texas at Austin students, faculty, and staff.

- **Full-service online searches** on over 400 databases in all subjects available through commercial vendors, done by a librarian in consultation with the user, charged for on a cost recovery basis. Costs average $10-50.

- **Monthly "current awareness" printouts** obtained through the same commercial vendors, and charged for on a cost recovery basis. Costs average $10-15/month.

- **U-Search,** a "do-it-yourself" service with over 120 databases; available by appointment in PCL and the Chemistry, Engineering, Life Science, Physics-Mathematics-Astronomy, and Balcones Libraries (hours vary). There is a $5 charge for 20 minutes of search time. Users must first view a brief tutorial program and fill out a "search planner" sheet.

- **Chemical Abstracts** searching, available under a special program in the Chemistry Library. Costs average $5-10.

Free services

These databases, many of them in CD-ROM (compact disk) format, are available free of charge for all library users; unless otherwise indicated, searching is on a "do-it-yourself" basis.

- In the PCL Reference Room: **General Periodicals Index, ABI/INFORM** (business), **CINAHL** (nursing & allied health), **ERIC** (education), **MLA Bibliography** (literature), **PsycINFO**, **Public Affairs Information Service**.

- In the Undergraduate Library: **Reader's Guide to Periodical Literature, Academic Index,** and **Newsbank.**

- In the Engineering Library: **Applied Science and Technology Index.** Also, **Patent CD-ROM,** along with other sources of patent information.

- In the Life Science Library: **MEDLINE** and **MiniMEDLINE** (indexes to medical journals).

- **The UT Library Online Catalog,** listing 4 million items in the UT Austin libraries; searchable by author, title, title keywords, subject, and call number; providing information on the current status of a book (checked out, on reserve, etc.); available in campus libraries and from Data Processing and Computation Center terminals and personal computers.

- **OCLC** (Online Computer Library Center), giving exact bibliographic information and library locations nationwide for over 20 million books, available in the PCL Reference Room.

Related services

These are generally available free of charge, though a charge may be required for full-service search demonstrations.

- **Consultation and training** for those who wish to establish their own search accounts with online vendors.

- **Library instruction** sessions and printed materials explaining online and manual research methods.

Access for disabled users

If you are physically unable to use a terminal but want to take advantage of "do-it-yourself" services such as the Online Catalog, U-Search, InfoTrac, or CD-ROMs, please ask library staff for assistance. We will provide instruction for your research assistant/reader, or if that is not practical, we will conduct the search for you.

For more information

Contact the librarians in any General Libraries branch or John Kupersmith, Assistant for Computer-based Information Services (PCL 3.200, 471-3811).

THE GENERAL LIBRARIES • THE UNIVERSITY OF TEXAS AT AUSTIN • 11/89

Texas A&M University

STERLING C. EVANS LIBRARY OFFERS REFERENCE SERVICE VIA ELECTRONIC MAIL

The Sterling C. Evans Library has implemented an electronic mail service. This service allows you to send reference questions via E-mail and receive responses from the Reference staff. If you have a VM, PROFS, or VAX account, simply address your questions via e-mail to k026se@TAMVM1.

Whenever possible, E-mail questions received on Monday-Thursday will be responded to within 24 hours. Messages will be picked up each morning at 9 a.m. Questions received on Friday-Sunday will be responded to by the following Tuesday. The response will consist of an answer to the question or a request for information needed to answer the question.

The following requests can effectively be handled by E-mail:

1. Information about library services and facilities
2. Quick factual information, directory information
   (e.g. addresses of organizations, etc.)
3. Assistance using the library's online catalog
4. Verification of references
5. Suggestions for purchase

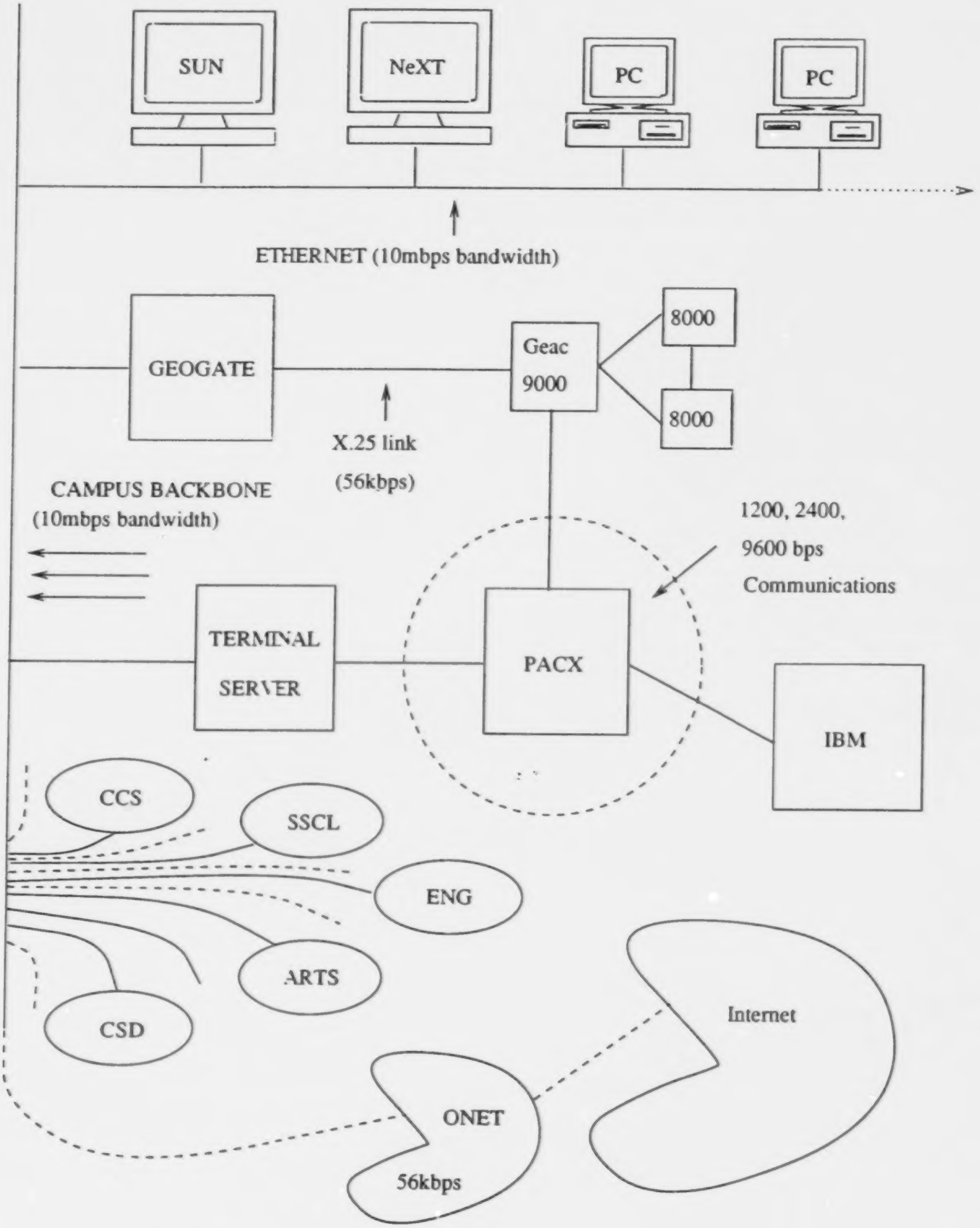
The service is not designed to handle in-depth research or lengthy projects. Patrons with numerous or more complicated questions are encouraged to come to the Library for reference assistance. The Reference Division may limit the number of requests per person.

9/90

Geac / Campus Network Configuration

University of Western Ontario

(geac.2.fig -- 90/05/04 -- jmb)


SUN
NeXT
PC
PC
ETHERNET (10mbps bandwidth)
GEOGATE
Geac
9000
8000
8000
X.25 link
(56kbps)
CAMPUS BACKBONE
(10mbps bandwidth)
1200, 2400,
9600 bps
Communications
TERMINAL
SERVER
PACX
IBM
CCS
SSCL
ENG
ARTS
CSD
Internet
ONET
56kbps

SYSTEMS AND PROCEDURES EXCHANGE CENTER

USER GUIDES

ASSOCIATION OF RESEARCH LIBRARIES OFFICE OF MANAGEMENT SERVICES

COMPUTER REFERENCE SERVICES

INFORMATION GUIDE

UCSB
Library

University of California
Santa Barbara

GETTING STARTED

The reference librarian can advise you on the suitability of your topic for a computer search, recommend appropriate databases, discuss costs, and process the search for you. Contact a reference librarian for information on computer search services at the following service desks:

Arts Library (893-2850)
art and music

Government Publications Department
(893-2863)
governmental studies, census data

Map and Imagery Laboratory (893-4049)
spatial data

Reference Department (893-3133)
social sciences and humanities

Sciences-Engineering Library (893-2765)
pure and applied sciences

WHEN YOU NEED INFORMATION FOR:

research
a paper
a thesis or dissertation
a publication
program or
 curriculum development
a grant proposal
a report
a lecture
a reading list
a site visit
 accreditation

The UCSB Library provides searching on a wide variety of computer databases. Some, available online and on CD-ROM at no charge, allow you to search the database yourself. Others are offered on a partial cost-recovery basis.

Many of the computer databases correspond to printed abstracting and indexing services which you may have used in your search for information. The online counterparts can provide you with rapid access to all terms in the printed publication.

In addition there are a growing number of other types of databases including:

full text	(complete text of journal articles, newspapers, or books)
numeric databases	(numeric or statistical data)
source databases	(directory or referral information)
spatial data	(maps and imagery)

Reference librarians can assist you in identifying these specialized databases.

COSTS

Mediated computer searches are offered on a partial cost-recovery basis. Charges vary according to the scope and complexity of your search request. The Library's searchers can estimate charges for your search. You can pay by check or by departmental recharge number.

ADVANTAGES OF A MEDIATED COMPUTER SEARCH

Reference librarians will act as mediators and conduct searches for you.

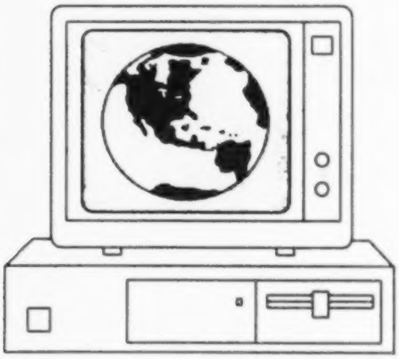
1. Each search is **CUSTOM DESIGNED** for your topic.
2. **COMBINATIONS** of index terms, title or abstract words, authors, institutions, etc. can be searched.
3. A computer search can be **FASTER** than a search in a printed index.
4. **MULTIPLE** databases can be accessed in a single search.
5. Single searches can cover a **LARGE SPAN OF PUBLICATION YEARS.**
6. Online databases are more **UP TO DATE** than their printed counterparts.
7. Search results can be **PRINTED** out or **DOWNLOADED** to your disk.
8. Automatic **UPDATE SERVICES** can be provided for many search topics.

Networking

at

Colorado State University

Your window
to the world



Colorado
State
University

University Computer Center

Introducing your campus network — CSUNet

CSUNet is Colorado State University's campus-wide network. It consists of a number of building and departmental local area networks (LANs) connected to a central Ethernet.

A LAN connects a number of electronic devices, such as PCs and printers. LANs usually link five to fifteen people. Each person using the LAN can share data, hardware and software with other users on the LAN.

At Colorado State University, many LANs are dispersed across campus. Some of these LANs are linked together with Ethernet cable to form a building or departmental LAN. These departmental LANs can be connected via fiber optic cabling to CSUNet.

Why use CSUNet?

High speed

LANs that are connected to CSUNet communicate at high speeds with other LANs at Colorado State and with other networks across the country.

Low cost

Once a building or departmental LAN has paid the initial fee to connect to the network, there are no usage fees.

World-wide scope

When you are connected to CSUNet, you literally have the world at your fingertips. You can login to thousands of computers in the United States, even Europe and Asia, in seconds. It doesn't matter if your colleague is next door, across campus or in another country. You can communicate with him or her easily and conveniently through the network.

No long distance charges

Using CSUNet, there are no long distance phone charges. You can send e-mail to a colleague in Europe, transfer a file to Colorado State University's administrative computer, login to the Cray computer at NCAR and browse the CARL on-line library catalog — all without paying long distance phone bills.

Rapidly expanding

Network services are expanding rapidly both at Colorado State and across the nation.

From its beginning in February 1988, CSUNet has grown to serve nearly half the buildings on campus. In December 1988, eight organizations were connected to the network. Today, more than 20 departments, colleges or buildings are connected to the network.

In October 1988, about 300 organizations were connected to the national NSFNET network. Today, more than 850 organizations are connected to NSFNET. In the year from October 1988 to October 1989, traffic on NSFNET increased 550%.

Local control

At Colorado State each LAN is administered and controlled locally. Each department designs their LAN according to their needs and appoints a LAN manager to administer their network. The LAN manager enters data relating to the users of the LAN, secures passwords and controls LAN security.

Central support

The University Computer Center (UCC) provides analysis, design, installation, trouble-shooting, repair and support services for on-campus LANs. UCC staff work closely with departmental LAN managers to ensure simple, reliable and effective operation of the network.

January 1990

Whom do I call?

The Computer Center Consulting Office, 491-7276 can answer questions about CSUNet and help you find solutions to your networking problems.

Need to know how to connect to CSUNet? Need information about resources available on the Internet?

Contact Michael Moravan at 491-7432. He can assist you in planning, managing and connecting your LAN to CSUNet. Moravan also can answer questions about the Internet and other national networks.

Need help wiring your office and installing cables and hardware for your LAN?

Contact Bill Kamm at 491-5194. He can help you with the layout, cabling and installation of a departmental or building LAN. Kamm also supervises the Computer Center's Engineering, Maintenance and Networking group which fixes network hardware problems.

Need help selecting LAN software that will be compatible with CSUNet and other national networks?

Contact Dean Wallace at 491-7444. He can help you select a LAN operating system and application software.

Interested in connecting your PC to the network?

Contact Larry Weber at 491-6098. He can help you configure your PC to work on the network.

We want to hear from you...

Your suggestions, comments and complaints about the network and the Computer Center are welcome. Call Gary Edelen at 491-7231 to offer your feedback.

The people are the network

A network consists of the protocols and cabling used to connect a variety of electronic devices.

Your PC, terminal or workstation is your window to the network and a communications line to the rest of the world.

A network enhances sharing of resources and knowledge.

People can use the network to

- communicate with colleagues both on and off campus,
- share text files, data, software and other resources, such as printers and dial-out modems, with others on their LAN,
- send electronic mail to others on the network,
- login to central computers on campus, including the administrative computer and other departmental computers,
- access on-line library catalogs and
- access national supercomputing centers and thousands of other computers across the United States and in Europe and Asia.

Network services

Electronic mail

Using electronic mail, you can communicate with colleagues both on and off campus. You can send messages to other users located on your host computer or a different host computer on another network. Any user can send mail to any other user, providing both have authorized access to a computer on the network.

File transfer (FTP)

Using FTP, you can transfer files from one computer to another. Sitting at your desk, you can move files from one computer to another within seconds with no errors, and there are no long distance charges to pay.

Remote login (Telnet)

Using Telnet, you can access and login to a remote computer over a network. Once you are connected to the remote computer, you may use it as though you were connected to it directly with a terminal. You can access resources and software not available on your own computer or even at Colorado State.

Network file system (NFS)

Using NFS, you can access files on a remote computer as though they were located on your own disk drive.

Coming Attractions ...

The following services are projected to be added to CSUNet in the future. Contact Gary Edelen at 491-7231 for more information.

- *Chat*
- *Bulletin board*
- *Conferencing*
- *Mailboxes*
- *Optical character reader (OCR)*
- *Printer server*

How do I get started?

Anyone at Colorado State University who wants to use the network can gain access to it.

Any user of the CYBER 840 computer is already connected to the network and can take advantage of most of the services listed above.

Any user who has a terminal or PC equipped with a Gandalf box or dial-up modem can use the network by accessing the terminal server connected to the PACX.

Any LAN in a building that has been cabled to CSUNet can connect to the network with minimum cost and effort.

We're here to help you ...

For information about any of the following CSUNet services or resources, contact the people listed below:

Administrative computing	Ron Dawe	491-1580
Anonymous FTP	Nancy Wilson	491-5246
Electronic library services	Library Reference Desk	491-1841
Electronic mail	Kim Haerter	491-7315
On-line telephone directory	Ric Miller	491-7560
Supercomputing	John Cooley	491-6017
Usenet news groups	Megan Stewart	491-7222

The CIS computing labs are dedicated to serving the computing needs of the University community. All users have equal privileges and access to the facilities, and all are expected to use the facilities in a responsible manner for the courtesy of all. Inquiries or questions should be directed to David Schatz, Manager of Computing Lab Services, 110 Old Engineering Hall. Call 624-4721.

Consulting

User consulting services are available at all CIS-supported computing labs. Consultants are on duty when the labs are open. CIS consulting services are also provided at the following locations:

- *The Faculty Technology Evaluation and Consulting Center,* 110 Old Engineering Hall, 8:30 a.m. to 5:00 p.m., Monday - Friday. Call 624-9356.
- *The Personal Computer Support and Service Center,* 204 Bellefield Annex, S. Bellefield Avenue, 10:00 a.m. to 4:00 p.m., Monday - Friday. Call 624-1380.

Classrooms

The computing lab classroom facilities are a valuable yet limited teaching resource for presentation, supplemental instruction, or supervised examination purposes for credit courses and training. For reservations, call 624-9330.

Equipment

- **1075 Benedum Hall**
  - VT131 terminals
  - VT131 instructor's terminal
  - Data display screen and Electrohome projector
  - LA50 printers
  - Network connection to the mainframes
- **G-27 Cathedral of Learning (Macintosh classroom)**
  - Macintosh SE PCs
  - Kodak datashow projector
  - Ethernet connection to the mainframes
- **1E01 Forbes Quadrangle**
  - Three classrooms containing: AT&T 6300 PCs, Kodak datashow
  - Classroom 3 has 12 AT&T w/ 20 MB hard disk
  - File/print servers; HP LaserJet
  - Ethernet connection to the mainframes

Computing Lab Policies

- Only University of Pittsburgh faculty, staff, and students are permitted to use the computing labs.
- Personal computer software is available only with a validated University of Pittsburgh ID.
- Personal computer software may not be copied or removed from the computing lab unless it is from the "FREEWARE" directory on the application servers.
- Documentation is available only with a validated University of Pittsburgh ID.
- No smoking, eating, or drinking is permitted in the labs.
- Courteous, quiet behavior is required when using the computing lab services. Anyone exhibiting abusive behavior in a CIS computing lab will be brought before the Student Judicial Board for disciplinary actions.
- Non-CIS advertisements are prohibited in the computing lab areas.
- The primary purpose of the computing lab is for academic related work. Persons using the lab facility for entertainment purposes may be asked to relinquish the computer device.
- Misappropriation of any start-up disk, software disk or reference materials will result in a $10.00 fine in addition to the replacement cost of the item(s).

FALL 1990

Campus

Computing Labs

University of Pittsburgh
Computing and Information Services

Software for DOS machines

Users who wish to store data should have their own disks. The AT&T 6300s and IBM XTs & ATs use 5 1/4" disks. The Zeniths and Digitals use 3 1/2" diskettes. The IBM PS/2s can accommodate both disk formats.

Users may access the software listed here for use in the labs with DOS personal computers. Not all packages are available at all labs. Check with computing lab staff for software availability.

Biblio 1.2 – a software utility for downloading bibliographic information from PITTCAT.

CC 4.11 – programming language used for electrical engineering.

dBASE III PLUS 1.1 – a relational data base managment system which allows users to store, search and sort data which can later be used to generate reports.

DOS – operating system for AT&T and IBM compatible PCs; provides commands for file creating, editing and copying.

Ethnograph 3.0 – software for ethnographic and anthropological research.

LINDO-pc 4.0 – linear programming language.

LOTUS 1-2-3 2.01 – an integrated spreadsheet, graphics and data base application; allows the user to create worksheets and then display the data as charts and graphs.

Microsoft Fortran 5.0 – programming language.

Microsoft Word 5.0 – text processing program.

NCSA/Telnet 2.2 and 2.3 – file transfer and terminal emulation software.

PageMaker 3.0 – desktop publishing tools. Streamlines publication design, layout and production.

PC PaintBrush 1.0 – graphics program.

ProCite 1.4 – bibliographic formatting software.

QuickBasic 4.5 – Basic programming lanugage.

@RISK 1.5 – add-on to Lotus 1-2-3 for simulation.

SYSTAT 4.1/SYGRAPH 1.1 – statistical package.

SPSS PC + 2.0 – a statistical analysis software package.

TK!Solver – a program designed to solve math problems including functions, converting units of measurement, and graphs and tables.

TSP 5.1 – a time series analysis package.

TURBO C 1.5 – a compiler with its own editor, designed especially for C programming in conjunction with the DOS operating system.

TURBO Pascal 5.5 – a programming language.

WATFOR77 FORTRAN 3.0 – FORTRAN programming language.

WATFOR77 GKS 2.0 – standard graphics interface to WATFOR 77 FORTRAN.

WordPerfect 5.0 – lets the user format documents, reports, letters, outlines, and memos; can handle footnotes and endnotes.

A variety of faculty-developed courseware is available on the computing lab fileservers. Any faculty member may arrange to have his/her software placed in the lab for access by students. License agreements must be shown at the time of installation. Please contact Mark Orwig at 648-1884 for further details.

Software for the Apple Macintosh

Users who wish to store data should have their own 3 1/2" diskettes, available at The Book Center, the PC Center, or any computer supply store.

Users may access the software listed here in the labs with Macintosh personal computers. Not all packages are available at all labs; check with computing lab staff for software availability.

EXCEL 2.2 – an integrated spreadsheet, graphics and data base application; allows the user to create worksheets and subsequently display the data as charts and graphs.

HyperCard 1.2.5 – HyperText application.

Lightspeed C – C programming language.

MacDraw 1.9.8 – designed for creating two-dimensional drawings such as flowcharts, floor plans, forms and presentation graphics.

MacPaint 1.5 – lets the user create pictures using various drawing tools and patterns such as paintbrush strokes, shading and outlining.

MacWrite II 1.1 – designed to create documents, letters and memos; supports a variety of font types, sizes and styles.

Microsoft Word 4.0 – lets the user format documents, letters, reports and memos; has the capability of footnotes, superscripts and subscripts, able to merge files from other Macintosh software packages.

NCSA/Telnet 2.3 – a file transfer and terminal emulation program.

PageMaker 2.0 – desktop publishing tools. Streamlines publication design, layout and production.

ProCite 1.34 – bibliographic formatting software.

Statview 512+ 1.2 – statistical package.

Super Paint 1.1 – combines the capabilities of MacPaint and MacDraw to let the user create pictures.

New Software Available For Fall Term

Macintosh	*DOS*
Expressionist	Math CAD
Microsoft Works	PC Globe
SPSS-Mac	PC USA
	SIMNON

Site-Licensed & Public Domain Software

Several site-licensed and public domain software packages are currently available in the labs to all University users free of charge. This includes current versions of virus detection and eradication software.

Each package requires one disk to copy. If you wish to have a copy of one of the packages, bring a blank disk and make a copy from the lab's local application server. See the student programmer for assistance.

Public Domain Software		**Site-Licensed Software**
Macintosh	*DOS machines*	*DOS machines only*
MacKermit	Biblio	LINDO-pc
NCSA/Telnet	Kermit	WATCOM Fortran
Virus Software	NCSA/Telnet	WATCOM Word Processor
	Virus Software	WATFOR77 Fortran
		WATFOR77 GKS

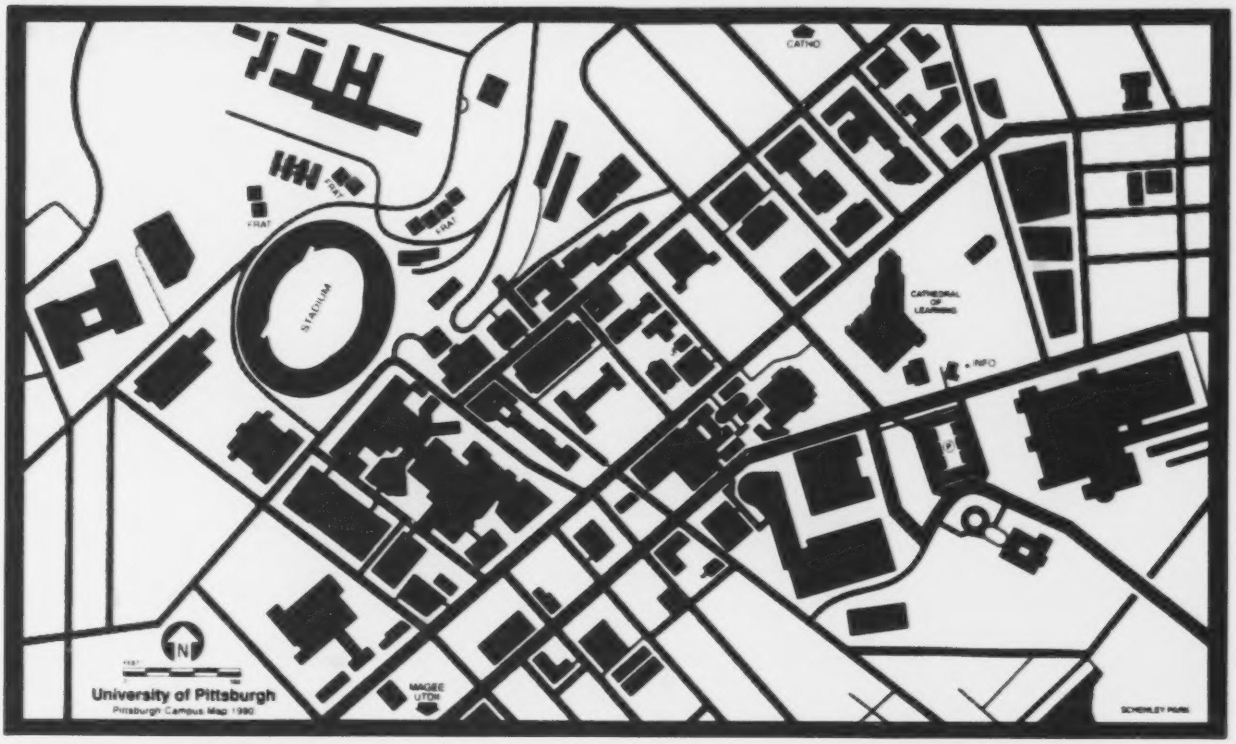
Starting this Fall, you will need a computer account (CAP) to use personal computers and peripherals.

Set up your account at the following locations:

[illegible] Benedum Hall · [illegible] Forbes Quadrangle · [illegible]
210 David Lawrence Hall · [illegible] Cathedral of Learning

To receive a CAP account, you must present your validated Pitt ID.

Map



Advanced Graphics Lab 360 Benedum Hall (BENDM)	***624-7140 - Consultant*** ***624-8338; Joe Caretto, lab supervisor*** Video digitizing stations IBM/AT 8mhz Frame Buffers. RGB high-resolution monitors Sun 3/260 CXP with TAAC Board, GP2 graphics accelerator & RGB monitor Sun 3/60 workstations, RGB displays Sun 3/280 file server, monochrome display Sun 3/80 workstations, RGB displays Video micrography and image analysis from microscopic slide specimens Summasketch manual digitizer tablets Ethernet connection to PittNet Quadjet Inkjet Printer Mitsubishi black & white thermal plotter HP 7470/75 color pen plotters HP 7576A-HPXL color pen plotter Shinko thermal plotter (300 DPI) Polaroid video plotter Matrix QCR-Z camera Numonics digitizer Eikonix digitizing system CD ROM reader Apple LaserWriter
569/570 Benedum Hall (BENDM)	***648-1247 - Consultant*** ***624-3235; lab supervisor (vacant)*** Digital 386 color monitor DOS devices IBM/XT personal computers File/print server Epson FX-86 printers HP Color LaserJet Plotter HP LaserJet Series II printers HP ScanJet Plus Scanner DEC LPS40 laser printer (Queue BEH)
1075 Benedum Hall (BENDM)	***624-3235; lab supervisor (vacant)*** Digital VT131 terminals Digital VT131 instructor's terminal Video display monitor Electrohome projector Tektronix hardcopy unit Retrographics terminals LA80 printers
Bouquet Annex (CLAB)	***624-7357 - Consultant*** ***624-7358; Sharon Swaney, lab supervisor*** Macintosh Plus personal computers File/print server DataProducts PostScript laser printers
G-27 Cathedral of Learning (CL)	***624-7795 - Consultant*** ***624-1044; Cheryl Thomas, lab supervisor*** Macintosh SE personal computers Macintosh Plus personal computers File/print server 2 DEC LPS40 laser printers (Queue CL)
G-62 Cathedral of Learning (CL)	***624-6693 - Consultant*** ***624-1044; Cheryl Thomas, lab supervisor*** Labs will be closed for equipment upgrade and reconfiguration.
230 David Lawrence Hall (LAWRN)	***624-8349 - Consultant*** ***648-1884; Mark Orwig, lab supervisor*** Macintosh Plus Macintosh II personal computers IBM PS/2 computers Apple scanner PC for the visually handicapped File/print servers HP LaserJet Series II printer 2 DEC LPS40 laser printer (Queue DLH)
1E01 Forbes Quadrangle (FQUAD)	***624-7143 - Consultant*** ***624-3241; Anthony Bollinger, lab supervisor*** AT&T 6300 PCs File/print server HP LaserJet Series II printers DEC LPS40 laser printer (Queue FQ)
Hillman Library Research Lab (HLMAN)	***648-2328 - Consultant*** ***648-7724; Melanie Dresser, lab supervisor*** Macintosh Plus personal computers Zenith DOS personal computers Station for wheelchair access Macintosh station for visually impaired users File/print servers DataProducts PostScript laser printer
Advanced Technology Lab B-3 Old Engineering Hall (EH)	***624-8344 - Consultant*** ***624-8338; Joe Caretto, lab supervisor*** DecStation 2100 DecStation 3100 Apple LaserWriter
B-9 Old Engineering Hall Printing Operations (EH)	***624-5062 - Consultant/Operator*** ***624-5061; Gary Masker, lab supervisor*** Xerox 8700 laser printer (Queue XEROX) 1 DEC LPS40 laser printer (Queue OEH)

Fall Term 1990 Campus Lab Schedule

Computing Lab	August 29 through November 20		November 26 through December 15	
Advanced Graphics Lab 360 Benedum Hall	Sun. - Thurs. Fri., Sat.	Noon - 8 p.m. Noon - 6 p.m.	Mon. - Thurs. Fri. Sat. Sun.	9 a.m. - 10 p.m. 9 a.m. - 6 p.m. Noon - 6 p.m. Noon - 10 p.m.
569/570 Benedum Hall	Sun. - Thurs. Fri., Sat.	9 a.m. - 10 p.m. 9 a.m. - 6 p.m.	Sun. - Thurs. Fri., Sat.	9 a.m. - 2 a.m. 9 a.m. - 10 p.m.
1075 Benedum Hall	Sun. - Thurs. Fri., Sat.	9 a.m. - 10 p.m. 9 a.m. - 6 p.m.	Sun. - Thu. Fri., Sat.	9 a.m. - 2 a.m. 9 a.m. - 10 p.m.
Bouquet Annex	Mon. - Thurs. Fri. Sat., Sun.	Noon - 10 p.m. Noon - 6 p.m. CLOSED	Mon. - Thurs. Fri. Sat., Sun.	10 a.m. - 10 p.m. 10 a.m. - 6 p.m. CLOSED
G-27 Cathedral of Learning	Sun. - Thurs. Fri., Sat.	9 a.m. - 10 p.m. 9 a.m. - 6 p.m.	Sun. - Thurs. Fri., Sat.	9 a.m. - 2 a.m. 9 a.m. - 10 p.m.
G-62 Cathedral of Learning	OPEN AS REQUIRED		OPEN AS REQUIRED	
230 David Lawrence Hall	Mon. Tues. - Thurs. Fri. Sat. Sun.	7 a.m.- Midnight 24 HOURS Midnight - 10 p.m. 8 a.m. - 10 p.m. 8 a.m. - 2 a.m.	Mon. Tues. - Sun.	Midnight - 2 a.m. 7 a.m. - Midnight 24 HOURS
1E01 Forbes Quadrangle	Mon. - Fri. Sat., Sun.	9 a.m. - 10 p.m. Open for scheduled classes only.	Mon. - Thurs. Fri. Sat., Sun.	9 a.m. - 2 a.m. 9 a.m. - 10 p.m. Open for scheduled classes only.
Advanced Technology Lab B-3 Old Engineering Hall	Sun. - Thurs. Fri., Sat.	Noon - 8 p.m. Noon - 6 p.m.	Mon. - Thurs. Fri. Sat. Sun.	9 a.m. - 10 p.m. 9 a.m. - 6 p.m. Noon - 6 p.m. Noon - 10 p.m.
B-9 Old Engineering Hall (Printer)	Mon. Tues. - Sun.	7 a.m. - 6 p.m. 6 a.m. - 6 p.m.	Mon. Tues. - Sun.	7 a.m. - 6 p.m. 6 a.m. - 6 p.m.
Hillman Library Research Lab	Lab hours are the same as library's hours. Call 648-2328 for schedule.			

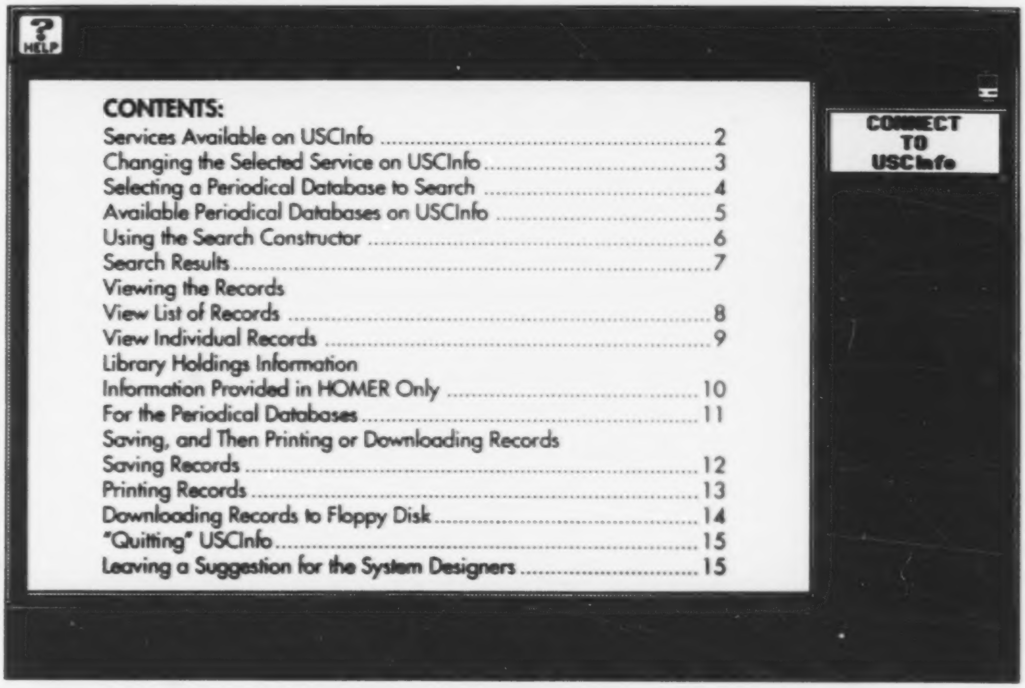
Changes to the computing lab schedule are announced on-line in VTX LABSCHED *and* SYS:SCHED.NWS *on VMS and* "type schedule" *on UNIX.*

Holiday Schedule: Labs Open

	Adv. Graphics	BENDM10	BENDM5	LAWRN	HLMAN	EH (printer)
Labor Day; Thanksgiving Break (Sept. 3; Nov. 21, 23, 24 & 25)	CLOSED	CLOSED	CLOSED	10 a.m. - 10 p.m	Same as Library hours	10 a.m. - 6 p.m
	All labs closed Nov. 22; Dec. 24, 25 & 31; and Jan. 1, 1991					
Dec. 16 through Jan. 3, 1991	Noon - 6 p.m. CLOSED Sat.&Sun.	9 a.m. - 6 p.m.	9 a.m. - 6 p.m.	8 a.m. - 10 p.m	Same as Library hours	Mon. 7 a.m. - 6 p.m. Tues. - Sun. 6 a.m. - 6 p.m.

A Guide to the Macintosh Interface to

USCInfo



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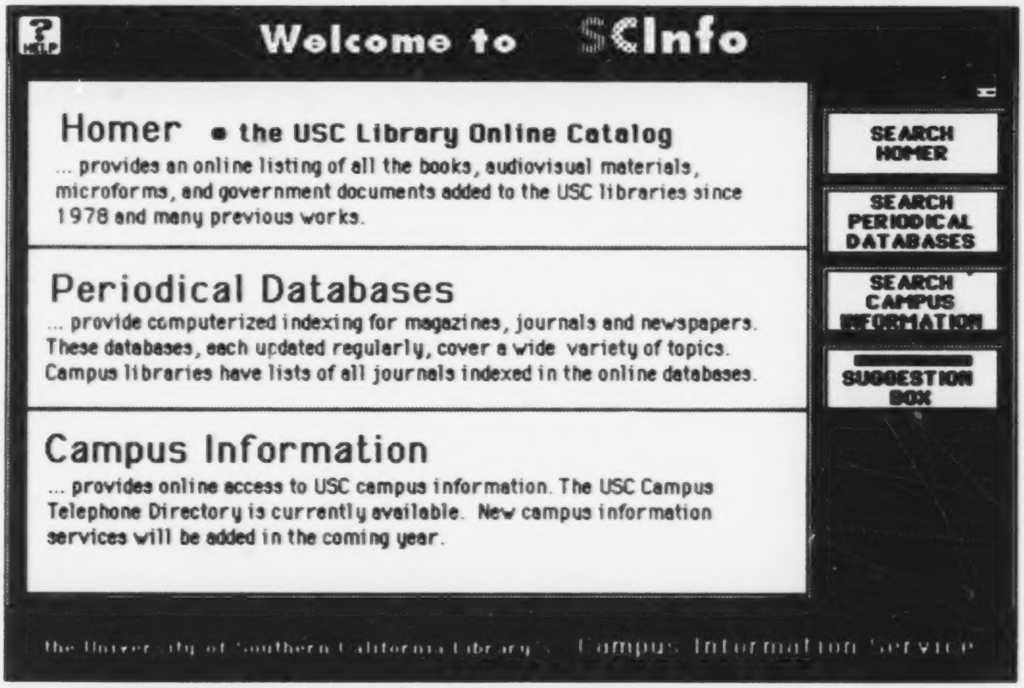
developed by the
USC Center for Scholarly Technology
and the
USC University Library

Services Available on USCInfo:

THE USCInfo SYSTEM CURRENTLY PROVIDES THREE DIFFERENT CAMPUS INFORMATION SERVICES AS SHOWN BELOW:



Welcome to USCInfo

Homer • the USC Library Online Catalog

... provides an online listing of all the books, audiovisual materials, microforms, and government documents added to the USC libraries since 1978 and many previous works.

Periodical Databases

... provide computerized indexing for magazines, journals and newspapers. These databases, each updated regularly, cover a wide variety of topics. Campus libraries have lists of all journals indexed in the online databases.

Campus Information

... provides online access to USC campus information. The USC Campus Telephone Directory is currently available. New campus information services will be added in the coming year.

the University of Southern California Library's Campus Information Service

The following important differences should be noted about each of these services:

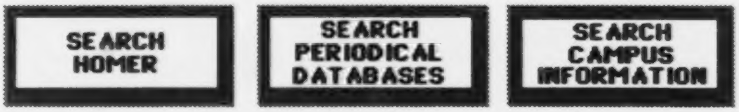
HOMER is the Library's online catalog. HOMER is the only service on the system that actually provides information about what materials the Library owns and where they are located. HOMER also provides "status" information about these materials (whether or not they are available for checkout). HOMER provides information about the books, audiovisual materials, microforms, and government doucments added to the USC libraries since 1978. Many, *but not all,* works acquired before 1978 are also included. For these older items, look first in HOMER, and then in the card catalog if necessary. Note that HOMER can be used not only to find out whether the Library owns a specific title, but can also be searched to find out which materials the Library owns about a specific subject or by a specific author. Library holdings are provided automatically as part of the information displayed in HOMER. Note that HOMER *will not* provide information about materials *not owned* by the Library. HOMER also does not provide information about individual articles in serials. For this information, consult the Periodical Databases.

The following important differences should be noted about each of these services:

The **PERIODICAL DATABASES** service on USCInfo provides subject information about articles found in over 6,900 magazines and journals as well as complete information about articles found in 5 major US newspapers (*Christian Science Monitor, Los Angeles Times, New York Times, Wall Street Journal and Washington Post*). The service currently contains 14 different databases grouped into 6 major subject categories. The PERIODICAL DATABASES are a guide to finding information about a desired subject or topic; they do not include information about Library holdings. Once relevant information has been found in the PERIODICAL DATABASES, HOMER must be checked to determin Library holdings.

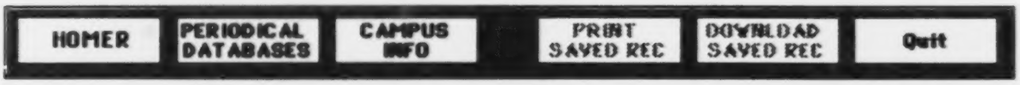
The **CAMPUS INFORMATION** service on USCInfo will begin to provide online access USC campus information. The Central Library System and University Computing Services are seeking to expand the resources available on USCInfo. We welcome your suggestions as to the information you would like to see available through USCInfo. Please see the last page of this guide for information on how to make such suggestions.

POINT TO AND THEN CLICK ON THE APPROPRIATE BUTTON TO SELECT THE DESIRED USCInfo SERVICE........



CHANGING THE SELECTED SERVICE ON USCInfo:

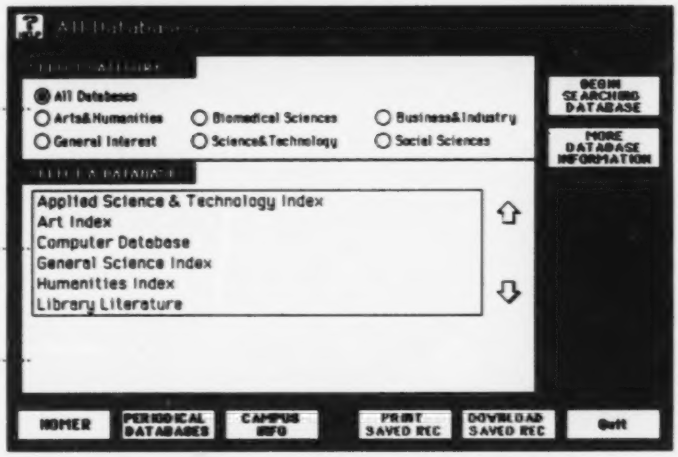
The following COMMAND BAR appears on the bottom of all successive USCInfo screens. Use these buttons to change from one USCInfo service to another.



Clicking on either the HOMER, PERIODICAL DATABASES or CAMPUS INFO buttons will move the system to the beginning screen of each service. The QUIT box, takes the system back to the "Welcome to USCInfo" screen shown to the left.

Selecting a Periodical Database to Search:

Because the USCInfo Periodical Databases service includes 14 different databases, the desired database must first be selected prior to initiating a search. The selection screen, illustrated below, provides 2 methods of viewing or listing the Periodical Databases available on USCInfo, as well as providing information about each of the databases:


● All Databases
○ Arts&Humanities
○ Biomedical Sciences
○ Business&Industry
○ General Interest
○ Science&Technology
○ Social Sciences
Applied Science & Technology Index
Art Index
Computer Database
General Science Index
Humanities Index
Library Literature
⇧
⇩
BEGIN SEARCHING DATABASE
MORE DATABASE INFORMATION
HOMER
PERIODICAL DATABASES
CAMPUS INFO
PRINT SAVED REC
DOWNLOAD SAVED REC
Quit

Available databases can be listed/viewed by broad **SUBJECT CATEGORY** ....

An alphabetical listing of **ALL DATABASES** is the default listing provided by the system as shown here ....

A brief description becomes active when a databases has been selected ....

NOTE THE CURSOR ARROWS: Use the Mouse to point to and click on the appropriate arrow to move the listing up or down (⇧ or ⇩).

TO SELECT A DATABASE:
Use the Mouse to move the pointer on top of the desired database shown in the SELECT A DATABASE box, and click the Mouse. The database selected will now be highlighted and a brief description will appear at the bottom of the screen.

MORE DATABASE INFORMATION:	Click on this box, to view detailed information about the subjects and years covered in the selected database.
BEGIN SEARCHING DATABASE:	Click on this button to start searching the database.

TO CHANGE THE DATABASE BEING SEARCHED:
To switch databases from ANY screen, use the Mouse to move the pointer to the **PERIODICAL DATABASES** button and click the Mouse. The system will return to the screen displayed above.

Note: This database selection screen is ONLY found in the Periodical Databases service on USCInfo. Currently, both the HOMER and CAMPUS INFO services contain only one database selection and, therefore, do not include a database selection screen.

Available Periodical Databases on USCInfo

The periodical databases available on USCInfo, each updated regularly, cover a wide variety of topics. Campus libraries have lists of all journals indexed in the online databases. For older articles not indexed in USCInfo, consult a librarian for referral to other sources. Available databases are listed below in alphabetical order:

APPLIED SCIENCE & TECHNOLOGY INDEX	1983 to present
ART INDEX	1984 to present
COMPUTER DATABASE INCLUDES ABSTRACTS	1986 to present
GENERAL SCIENCE INDEX	1984 to present
HUMANITIES INDEX	1984 to present
LIBRARY LITERATURE	1984 to present
MAGAZINE INDEX	1983 to present
MANAGEMENT CONTENTS INCLUDES ABSTRACTS	1986 to present
MEDLINE INCLUDES ABSTRACTS (Index Medicus, Index to Dental Literature, and International Nursing Index) Offered jointly by the Central Library System and Health Sciences Libraries	1980 to present
NATIONAL NEWSPAPER INDEX for the following 5 newspapers: *Christian Science Monitor, Los Angeles Times, New York Times, Wall Street Journal, and Washington Post*	1981 to present
PAIS INCLUDES ABSTRACTS (Public Affairs Information Service)	1972 to present
PsycINFO INCLUDES ABSTRACTS (Psychological Abstracts)	1984 to present
SOCIAL SCIENCES INDEX	1984 to present
TRADE & INDUSTRY INDEX	1982 to present

To obtain more information about the content and subject areas covered by any of the available periodical databases, click on the MORE DATABASE INFORMATION button:

MORE
DATABASE
INFORMATION

Using the Search Constructor:

The SEARCH CONSTRUCTOR screen is available in and used to construct searches in all the USCInfo services. While each of the USCInfo services provides similiar search features and search options, there are some differences specific to the database being searched. The Search Constructor screen illustrated below is used for searching HOMER.

DEFAULT SEARCH SELECTIONS:

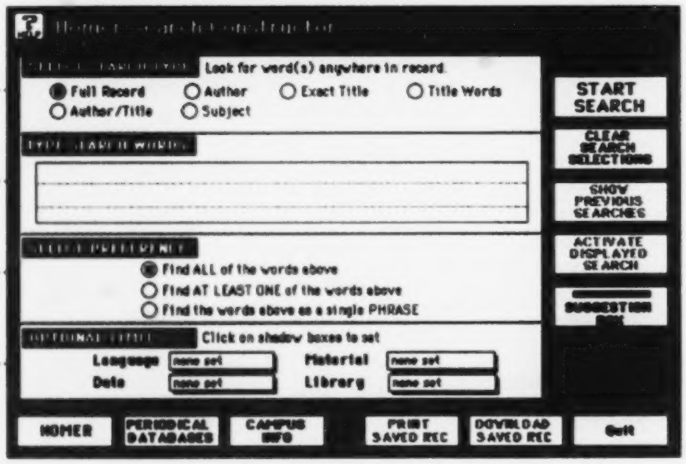
The Search Constructor is automatically set to the following search options:

SEARCH TYPE	set to search the Full Record (search all Fields in the record). NOTE: available Search Types may be different for different databases.
PREFERENCE	set to search ALL of the typed SEARCH WORDS
OPTIONAL LIMITS	none set NOTE: not all Optional Limits are available for all databases.

To use the Default Search Selections, use the keyboard to TYPE the desired SEARCH WORDS and use the Mouse to move the pointer to the START SEARCH button and click.

TO CHANGE THE DEFAULT SEARCH SELECTIONS:

Use the MOUSE to move the pointer to the appropriate button and then click.



Look for word(s) anywhere in record.

● Full Record ○ Author ○ Exact Title ○ Title Words
○ Author/Title ○ Subject

● Find ALL of the words above
○ Find AT LEAST ONE of the words above
○ Find the words above as a single PHRASE

Click on shadow boxes to set

Language: none set
Material: none set
Date: none set
Library: none set

START SEARCH
CLEAR SEARCH SELECTIONS
SHOW PREVIOUS SEARCHES
ACTIVATE DISPLAYED SEARCH
SUGGESTION BOX
HOMER
PERIODICAL DATABASES
CAMPUS INFO
PRINT SAVED REC
DOWNLOAD SAVED REC
Quit

SELECT A SPECIFIC SEARCH TYPE

TYPE WORDS TO BE SEARCHED

SELECT PREFERENCE

SET OPTIONAL LIMITS

ADDITIONAL NOTES ON THE SEARCH CONSTRUCTOR:

ON SEARCH TYPES:

- ◉ EXACT TITLE: Use ONLY when the exact title of an item is know, as it would appear on the title page of the item. When entering an Exact Title, the leading articles "a, an, the", for any language, should not be typed (ie. enter "The Sun Also Rises" as "Sun Also Rises".) If an Exact Title search is unsuccessful, try a TITLE WORDS search.
- ◉ TITLE WORDS: Use this search type to enter the major words in a title when the exact title is not know or when an EXACT TITLE search has been unsuccessful..

ON STOP WORDS:

"Noise words" and articles such as the, of, in, at, from, to, etc. have not been indexed EXCEPT when using EXACT TITLE Search. Do not type "noise words", since their use will result in a 0 records found search results.

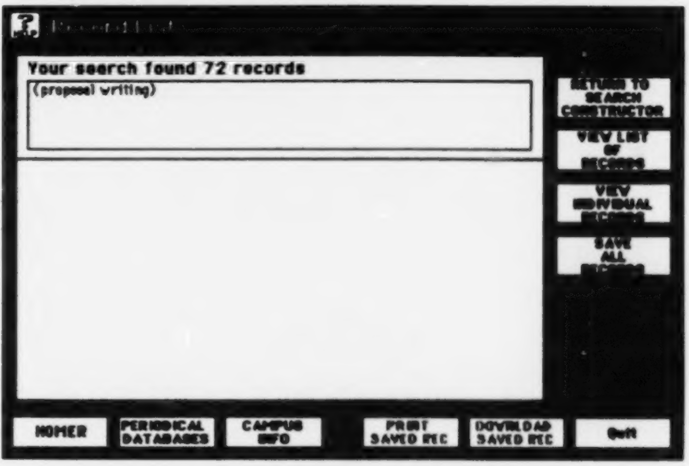
After selecting SEARCH OPTIONS and typing the desired search words, move the pointer to **START SEARCH** and click the mouse. The search will now be executed.

SEARCH RESULTS:

After the START SEARCH button is clicked, the database is searched and the system displays the SEARCH IN PROGRESS screen. After the database search is complete, the system will indicate the number of retrieved records as shown on the screen below:

NOTE:
Special Assistance Screens are provided in the blank space on the screen to the right when: ....

- 0 RECORDS ARE FOUND
- MORE THAN 200 RECORDS ARE FOUND



Your search found 72 records

(proposal writing)

RETURN TO SEARCH CONSTRUCTOR
VIEW LIST OF RECORDS
VIEW INDIVIDUAL RECORDS
SAVE ALL RECORDS
HOMER
PERIODICAL DATABASES
CAMPUS INFO
PRINT SAVED REC
DOWNLOAD SAVED REC
Quit

From here, 2 record viewing options are available.

Viewing the Records -
View List of Records
View Individual Records

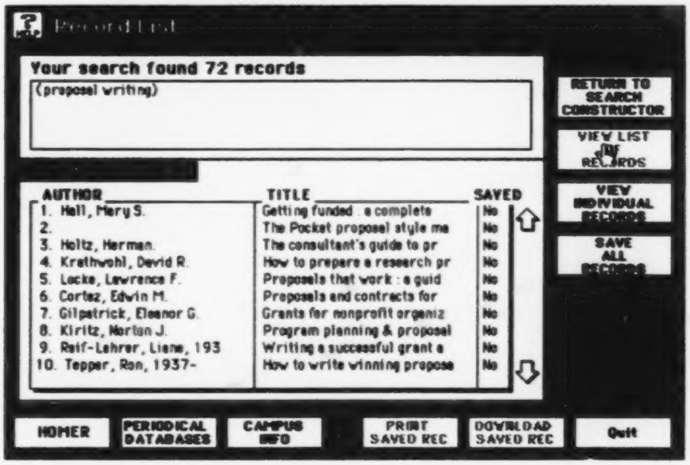
Either the VIEW LIST OF RECORDS or the VIEW INDIVIDUAL RECORDS buttons may be selected by moving the pointer and clicking the Mouse. The **VIEW INDIVIDUAL RECORDS** option, will display each individual record retrieved, starting with the first record. This option is most useful when the search retrieved only a few records and it is desirable to view them all. For searches that have retrieved a larger number of records, the **VIEW LIST OF RECORDS** option provides the ability to view a brief Author/Title listing of up to 10 records at a time. This option is useful in browsing the search results and selecting specific records to view. A RECORD LIST screen is illustrated below:

VIEWING INDIVIDUAL RECORDS FROM THE RECORD LIST SCREEN:

To VIEW the full record for any record shown on the Record List, move the pointer to any portion of the desired record and click the Mouse.

CLICK ON THE DOWN (⇩) ARROW to see the next 10 records in the List

CLICK ON THE UP (⇧) ARROW to see the previous 10 records in the List


Record List
RETURN TO SEARCH CONSTRUCTOR
VIEW LIST OF RECORDS
VIEW INDIVIDUAL RECORDS
SAVE ALL RECORDS
HOMER
PERIODICAL DATABASES
CAMPUS INFO
PRINT SAVED REC
DOWNLOAD SAVED REC
Quit

Your search found 72 records

(proposal writing)

AUTHOR	TITLE	SAVED
1. Hall, Mary S.	Getting funded : a complete	No
2.	The Pocket proposal style ma	No
3. Holtz, Herman.	The consultant's guide to pr	No
4. Krathwohl, David R.	How to prepare a research pr	No
5. Locke, Lawrence F.	Proposals that work : a guid	No
6. Cortez, Edwin M.	Proposals and contracts for	No
7. Gilpatrick, Eleanor G.	Grants for nonprofit organiz	No
8. Kiritz, Norton J.	Program planning & proposal	No
9. Reif-Lehrer, Liane, 193	Writing a successful grant a	No
10. Tepper, Ron, 1937-	How to write winning proposa	No

NOTE: Use of the SAVED and SAVE ALL RECORDS Features are described on page 12.

Individual Record Display:

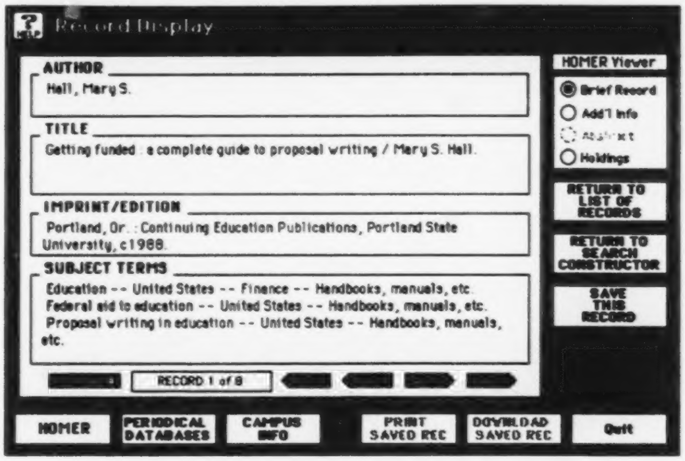
There are several components to an individual RECORD DISPLAY in USCInfo. The BRIEF RECORD display is always provided first by the system. This Brief Record display provides the most important information about the record, the AUTHOR, TITLE, SOURCE or IMPRINT information and the SUBJECT TERMS assigned to the record. A Brief Record Display is shown below:

NOTE THE DISPLAY OPTIONS:

- ● **ADD'L INFO**
  displays the FULL information about the record including other authors and titles and notes.

- ● **ABSTRACT**
  displays the Abstract. This button is only available when the record actually contains an abstract, otherwise it is greyed out and not selectable.

- ● **HOLDINGS**
  further information is provided on the next page.


Record Display
HOMER Viewer
● Brief Record
○ Add'l Info
○ Abstract
○ Holdings
RETURN TO LIST OF RECORDS
RETURN TO SEARCH CONSTRUCTOR
SAVE THIS RECORD
RECORD 1 of 8
HOMER
PERIODICAL DATABASES
CAMPUS INFO
PRINT SAVED REC
DOWNLOAD SAVED REC
Quit

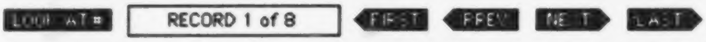
AUTHOR
Hall, Mary S.

TITLE
Getting funded : a complete guide to proposal writing / Mary S. Hall.

IMPRINT/EDITION
Portland, Or. : Continuing Education Publications, Portland State University, c1988.

SUBJECT TERMS
Education -- United States -- Finance -- Handbooks, manuals, etc.
Federal aid to education -- United States -- Handbooks, manuals, etc.
Proposal writing in education -- United States -- Handbooks, manuals, etc.

Note the options to view specific records :
The screen always indicates which record in the list of records is being viewed


LOOK AT #
RECORD 1 of 8
FIRST
PREV
NEXT
LAST

Move from record to record by clicking on the NEXT, the PREV the FIRST , or the LAST arrows. To see a specific record in the Record List, click on LOOK AT #.

HINT FOR SUBSEQUENT SEARCHES

When a particularly useful or relevant record is found when viewing a long list of retrieved records, note the SUBJECT TERMS assigned that record. These terms (or specific words in the terms) can be used in subsequent searches to retrieve all other records in the database that have been assigned these SUBJECT TERMS.

Library Holdings Information:
[THIS INFORMATION PROVIDED ONLY IN HOMER]

While the ◉ HOLDINGS button appears on records displayed in both HOMER and the Periodical Databases, ONLY HOMER records provide information about Library Holdings. In HOMER, from the Brief Record Display, click on the ◉ HOLDINGS button to view Library Holdings Information as shown on the screen below:

NOTE THE FOLLOWING INFORMATION PROVIDED ON THE HOLDINGS SCREEN:

The system indicates the Material's Format (THIS ITEM IS A....). The material's format will affect where in the Library the material can be found. Formats held in the Library include the following:

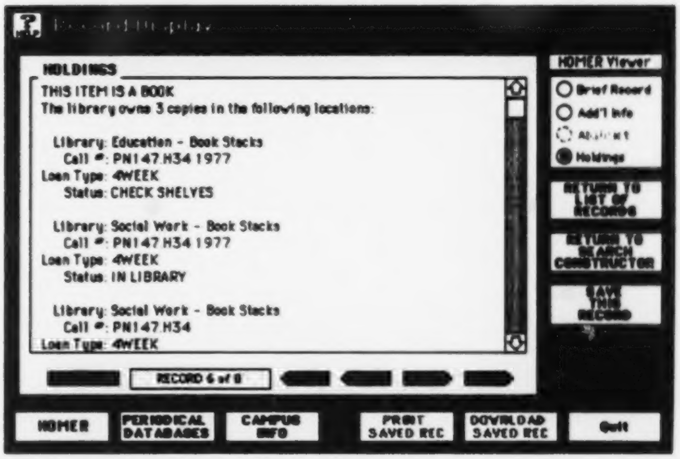
BOOKS and SERIALS as well as the following other material formats:
ARCHIVAL MATERIALS, AUDIOVISUAL MATERIALS, MACHINE READABLE DATA, MAPS, MICROFORMS, MUSIC SCORES, RECORDINGS (both musical and non-musical).

LIBRARY:
Indicates in which Library the item can be found.

CALL #:
Indicates where in the Book Stacks the item can be found.

LOAN TYPE:
Indicates if, and for how long, the item can circulate.

STATUS:
Indicates the item's circulation status - whether it is IN LIBRARY or in circulation.



```
HOLDINGS
THIS ITEM IS A BOOK
The library owns 3 copies in the following locations:

  Library: Education - Book Stacks
    Call #: PN147.H34 1977
Loan Type: 4WEEK
    Status: CHECK SHELVES

  Library: Social Work - Book Stacks
    Call #: PN147.H34 1977
Loan Type: 4WEEK
    Status: IN LIBRARY

  Library: Social Work - Book Stacks
    Call #: PN147.H34
Loan Type: 4WEEK
```

HOMER Viewer
○ Brief Record
○ Add'l Info
○ Abstract
● Holdings
RETURN TO LIST OF RECORDS
RETURN TO SEARCH CONSTRUCTOR
SAVE THIS RECORD
RECORD 6 of 8
HOMER
PERIODICAL DATABASES
CAMPUS INFO
PRINT SAVED REC
DOWNLOAD SAVED REC
Quit

REMEMBER! NOT ALL MATERIALS OWNED BY AND AVAILABLE IN THE USC LIBRARIES HAVE YET BEEN CATALOGED IN MACHINE READABLE FORM AND LOADED INTO THE HOMER DATABASE.

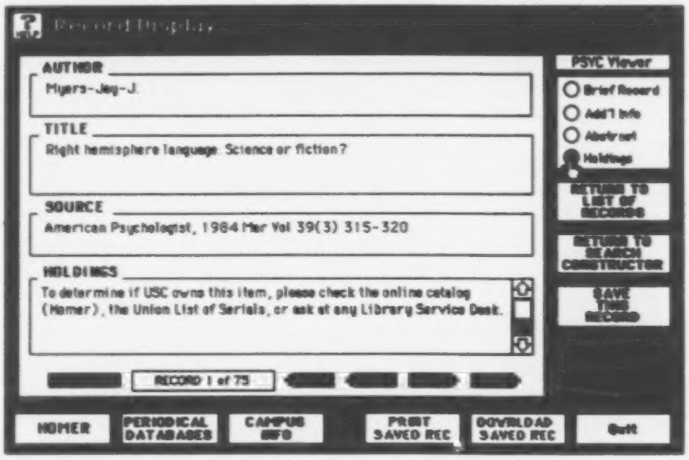
Many, *but not all*, works acquired before 1978 are included in HOMER. For these older items, look first in HOMER, and then in the card catalog if necessary. Additionally, *not all* of the USC Libraries' SERIALS Titles have yet been added to HOMER. Check the yellow *Union List of Serials* books for titles not found in HOMER. **When in doubt, seek the assistance of a librarian.**

Holdings Information in the Periodical Databases:

The Periodical Databases are guides to finding information about a desired subject or topic regardless of whether or not the materials are actually owned by the USC Libraries. Currently, the system can not provide Library Holdings Information for articles indexed in these databases, although work on such a feature is under development. Clicking on the ● HOLDINGS button in the Periodical Databases currently provides a generic message as illustrated below:

NOTE THE CITATION'S SOURCE FIELD

For magazine, journal and newspaper articles, this Field contains the TITLE and YEAR OF PUBLICATION of the magazine, journal or newspaper in which the article was published (page numbers are also provided).


Record Display
PSYC Viewer
○ Brief Record
○ Add'l Info
○ Abstract
● Holdings
RETURN TO LIST OF RECORDS
RETURN TO SEARCH CONSTRUCTOR
SAVE THIS RECORD
RECORD 1 of 75
HOMER
PERIODICAL DATABASES
CAMPUS INFO
PRINT SAVED REC
DOWNLOAD SAVED REC
Quit

AUTHOR
Myers-Jay-J.

TITLE
Right hemisphere language: Science or fiction?

SOURCE
American Psychologist, 1984 Mar Vol 39(3) 315-320

HOLDINGS
To determine if USC owns this item, please check the online catalog (Homer), the Union List of Serials, or ask at any Library Service Desk.

While it is extremely difficult to provide simple and concise generalized instructions on how to locate any specific item among the millions cited within the 14 different periodical databases, the following *Guidelines* should be useful:

- — MOST of the items cited are articles that appear in magazine, journal or newspaper publications. These articles are located by the finding the publication described in the SOURCE Field of the record.
  - Search the Publication Title in HOMER, the Library's online catalog for Library holdings information
  - Search the Publication Title in the bound, yellow *Union List of Serials* available at Library Referene Desks
  - Request the assistance of a Librarian.
- — OTHER materials include book reviews, art reproductions, chapters in books, etc.

PLEASE REQUEST THE ASSISTANCE OF A LIBRARIAN WHEN HAVING DIFFICULTY DETERMINING HOW TO FIND A CITED ITEM IN THE USC LIBRARIES.

Saving, and then Printing or Downloading Records:

All services on USCInfo provide the capability to first SAVE and then either print selected records or download selected records to a floppy disk. Printing/Downloading is a two-step process. Throughout a USCInfo search session, individual records, or groups of records, must first be selected and SAVED. As records are selected and SAVED, they are "stored" on the USCInfo mainframe computer. At the end of the USCInfo search session, when the PRINT or DOWNLOAD option is selected, all of the "stored" or SAVED records are transferred from the mainframe to the Macintosh computer being used. All the SAVED records are then either printed or downloaded in a single process, rather than one at a time.

LIMITATIONS: **PRINTING:** to control Library printing costs and prevent a single user from monopolizing any printer, there is a **50 record print limit** per USCInfo search session.

DOWNLOADING: since many USCInfo records are large, the system has a **200 record downloading limit.** This insures space is available on the floppy disk for all records being downloaded.

Saving Records:

Both the VIEW LIST OF RECORDS (p.8) and the VIEW INDIVIDUALS RECORDS (p.9) screens provide the capability to SAVE records.

ALL of the records retrieved by a given search can be saved by clicking on the SAVE ALL RECORDS button. (The system only allows up to 200 records to be saved. For searches resulting in more than 200 records, either narrow the search or save selected individual records as described below.)

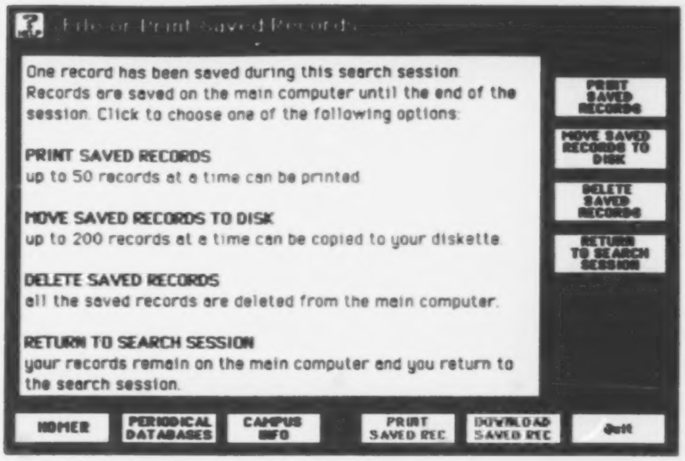
INDIVIDUAL records can be SAVED in two ways: From the Record List screen, there is a SAVED column next to each of the 10 records listed. This column is initially set as "No." To save an individual record from the list, click on the No next to the desired record and it will be saved. The system will display a Yes in the SAVED column next to any record that has been saved. To save an individual record from the individual Record Display screen, click on the SAVE THIS RECORD button.

The system keeps track of the total number of records being SAVED.

When a SAVE action will result in **more than 50 records** being saved, the system will provide the following message: After this save, you won't be able to print. Help, Cancel and OK options are provided.

When a SAVE action will result in **more than 200 records** being saved, the system will provide the following message: you can not save more than 200 records.

After the search session has been completed and the selected records SAVED, click on the desired **PRINT SAVED REC** or **DOWNLOAD SAVED REC** button on the black command bar at the bottom of the screen. The system will now initiate the desired action and display the screen shown below:


File or Print Saved Records

One record has been saved during this search session. Records are saved on the main computer until the end of the session. Click to choose one of the following options:

PRINT SAVED RECORDS
up to 50 records at a time can be printed

MOVE SAVED RECORDS TO DISK
up to 200 records at a time can be copied to your diskette.

DELETE SAVED RECORDS
all the saved records are deleted from the main computer.

RETURN TO SEARCH SESSION
your records remain on the main computer and you return to the search session.

The **TOTAL NUMBER** of SAVED records is provided

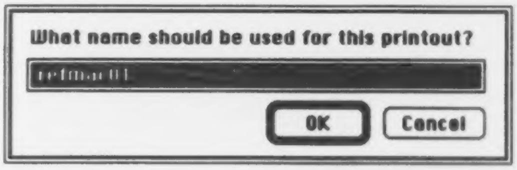
INSTRUCTIONS for each option are provided on this screen

CLICK ON the desired action to proceed

Printing Records:

After clicking on the PRINT SAVED RECORDS button, USCInfo begins the process of transferring the SAVED records from the mainframe computer to the Macintosh computer. The amount of time required to complete this process depends on the number and size of the records being transferred. The moving beach ball (⊗) symbol will appear on the screen while this process is taking place. After all records have been transferred, the system displays the following message box on the screen:

NAME THE PRINTOUT:
Since several Macs share the same printer, this feature labels the printout for identification.


What name should be used for this printout?

refmac01

The system automatically provides the individual Mac's "name" in this block. To change this, simply type the desire name and it will appear in the box. Click on OK and the printing process will be started. Again, the amount of time required will depend on the number and size of the records being printed. The top line of each page of output will be labled as follows:

This USCInfo ouput was requested by: the name input in the message box

Please check the heading on printed output to insure removing the right printouts from the printer.

Downloading Records to Floppy Disk:

**NOTE: The Library does NOT supply floppy disks. Users must bring their own disks.
The Mac will automatically provide the ability to format a non formatted disk.**

After clicking on the MOVE SAVED RECORDS TO DISK, USCInfo begins to process the SAVED records from the mainframe computer to the Macintosh computer. The amount of time required to complete this process depends on the number and size of the records being transferred. The moving beach ball (⊕) symbol will appear on the screen while this process is taking place. The system will now return the following prompt:

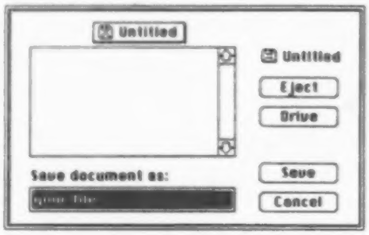
Do you want to copy file to floppy disk?

Click on the OK button and the system will now return the following prompt:

Place disk in drive and press mouse button.

The system now returns the message box shown below to allow naming of the file on disk that USCInfo records are to be downloaded to.

ASSIGN THE FILE A DOCUMENT NAME:
USCInfo will automatically download the SAVED records to a document file named "your file". The file may easily be renamed by simply typing the desired file name.



Save document as: your file

Again, the amount of time required to complete this process depends on the number and size of the records being downloaded. Once the downloading process is complete, the system will automatically eject the floppy disk and display a "Download complete" message. Click on the RETURN TO SEARCH SESSION or on the QUIT button to continue.

DOS FORMAT DISKS:

In each Library, at least one Mac will be equiped with special software to allow downloading of USCInfo records to a DOS formatted disk. These Macs will be clearly marked, indicating their ability to download to a DOS formatted disk.

SPECIAL NOTE: Occassionally a user may have SAVED records on USCInfo and left the machine prior to printing/downloading the SAVED records. This is indicated when the PRINT SAVED REC and DOWNLOAD SAVED REC buttons are not "greyed out" at the start of a USCInfo search session. To clear such records, use the DELETE SAVED RECORDS button on the File or Print Saved Records screen.

"QUITTING" USCInfo:

PLEASE QUIT USCInfo CORRECTLY, LEAVING THE SYSTEM AT THE WELCOME SCREEN FOR THE NEXT USER

When finished using USCInfo, please click on the QUIT button on the black COMMAND BAR that appears on the bottom of all USCInfo screens. This will return the system back to the initial WELCOME TO USCInfo screen. This action also automatically provides the ability to DELETE from the system any SAVED records not desired for print or download. While the Macs automatically "time out" and "logoff" after 10 minutes of no input, properly "quitting" the system is a courtesy to the next user.

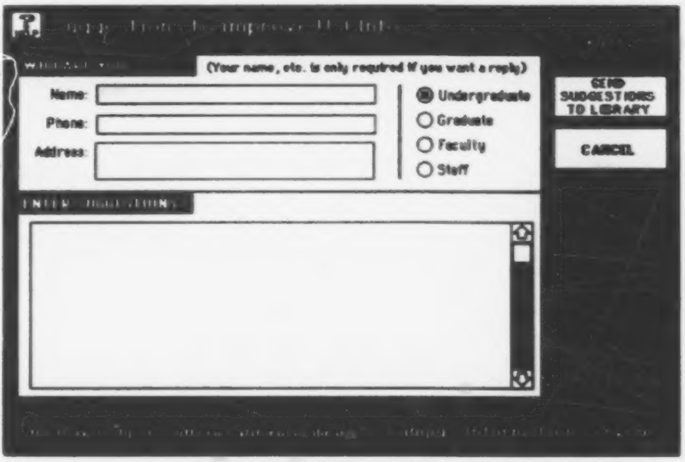
LEAVING A SUGGESTION FOR THE SYSTEM DESIGNERS:

USCInfo is under ongoing development and improvement. We anticipate adding additional resources and services to the system. The Center for Scholarly Technology, the Central Library System, and University Computing Services all request your input in helping us improve the USCInfo system and interface. We would especially appreciate hearing from you about aspects of the system you found difficult or confusing, as well as knowing what additional types of services you would find helpful. We would also like to know what about USCInfo YOU FOUND EASY TO USE AND HELPFUL. To allow you to communicate your comments to us, a SUGGESTION BOX feature has been provided to allow you to post comments to the system designers. The SUGGESTION BOX button appears on the WELCOME TO USCInfo screen. Click on this button and the system will provide the following screen:

TYPE YOUR NAME AND ADDRESS IF A REPLY IS DESIRED: ....

PLEASE INDICATE YOUR STATUS: ....

TYPE YOUR SUGGESTION:
Space is provided to make the message as long as desired. ....

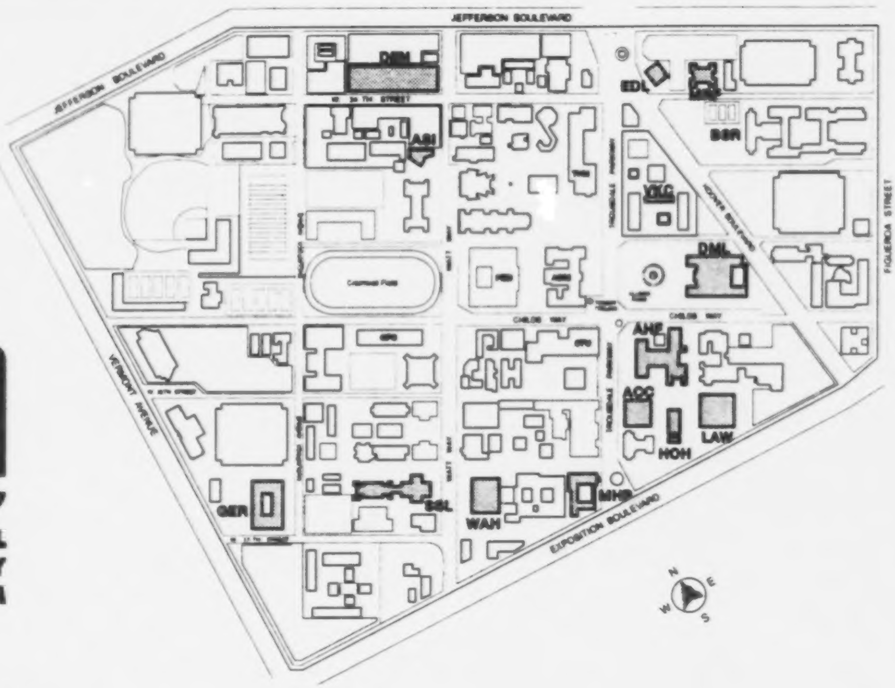


(Your name, etc. is only required if you want a reply)

● Undergraduate
○ Graduate
○ Faculty
○ Staff

If you have an E-Mail account and address, please provide this information in the Address box, since this makeS communication easier. Click on the SEND SUGGESTIONS TO LIBRARY and the message will be delivered. Once again, we do appreciate hearing from you!

USC Libraries


JEFFERSON BOULEVARD
JEFFERSON BOULEVARD
DEN
EDL
ASI
BSR
VKC
DML
AHF
ACC
LAW
HOH
MHP
WAH
SSL
GER
VERMONT AVENUE
FIGUEROA STREET
EXPOSITION BOULEVARD
N
E
S
W

CENTRAL
LIBRARY
SYSTEM

Map Key

Accounting	740-8519	ACC
Architecture Fine Arts	740-1956	WAH
Business	740-8520	HOH
Cinema	740-8906	DML
College	740-7044	DML
Dental	740-6476	DEN
Doheny	740-4039	DML
Education	740-1781	EDL
Gerontology	740-5990	GER
Government Documents	740-2339	DML
Hancock	740-7542	AHF
Hebrew Union	749-3424	32nd & Hoover
Law	740-6482	LAW
Medical	742-1530	2025 Zonal Ave.
Microtext Room	740-3573	DML
Music	740-0183	DML
Philosophy	740-07434	MHP
Schoenberg Archives	740-4086	ASI
Science	740-8507	SSI
Social Work	740-0213	MRF
Special Collections	740-5946	DML
Von KleinSmid	740-1769	VKC

NDLS

Network Data Library System

Data definition and retrieval software for data sets in the social sciences.

Social Science Computing Laboratory
Faculty of Social Science
University of Western Ontario
London, Ontario, Canada, N6A 5C2

Telephone Numbers

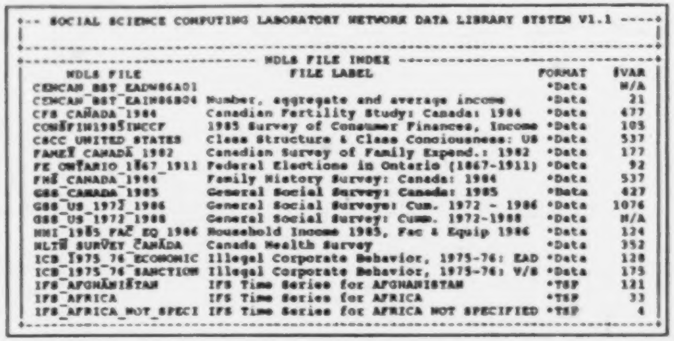
General Enquiries	(519) 661-2152
Fax Number	(519) 661-3868

Electronic Mail Addresses

Bitnet	SSCL@UWOVAX.BITNET
Netnorth	SSCL@VAXI.SSCL.UWO.CA
Bitnet	DRL@UWOVAX.BITNET
Netnorth	~~DLR~~@VAXI.SSCL.UWO.CA DRL

Description of NDLS

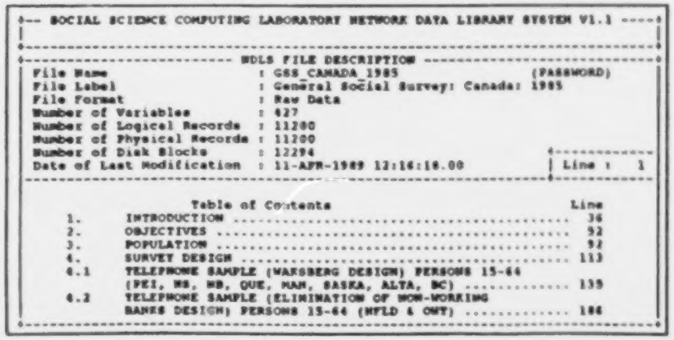
The Network Data Library System is a software package which was developed by SSCL in 1986 for managing, selecting, and retrieving machine readable data files (MRDFs). Virtually any MRDF can be added to the master index and subsequently retrieved online. A sample of MRDFs which are maintained within NDLS at Western is shown in the following example screen of the file index:



```
+-- SOCIAL SCIENCE COMPUTING LABORATORY NETWORK DATA LIBRARY SYSTEM V1.1 ----+
|                                                                            |
+----------------------------------------------------------------------------+
+------------------------- NDLS FILE INDEX ----------------------------------+
|    NDLS FILE                      FILE LABEL                  FORMAT  #VAR |
| CENCAN_BST_EADW86A01                                          *Data    N/A |
| CENCAN_BST_EAIN86B04 Number, aggregate and average income     *Data     21 |
| CFS_CANADA_1984      Canadian Fertility Study: Canada: 1984   *Data    477 |
| CONSFIN1985INCCF     1985 Survey of Consumer Finances, Income *Data    105 |
| CSCC_UNITED_STATES   Class Structure & Class Consciousness: US *Data   537 |
| FAMEX_CANADA_1982    Canadian Survey of Family Expend.: 1982  *Data    177 |
| FE_ONTARIO_1867_1911 Federal Elections in Ontario (1867-1911) *Data     92 |
| FHS_CANADA_1984      Family History Survey: Canada: 1984      *Data    537 |
| GSS_CANADA_1985      General Social Survey: Canada: 1985      *Data    427 |
| GSS_US_1972_1986     General Social Surveys: Cum. 1972 - 1986 *Data   1076 |
| GSS_US_1972_1988     General Social Survey: Cumm. 1972-1988   *Data    N/A |
| HHI_1985_FAC_EQ_1986 Household Income 1985, Fac & Equip 1986  *Data    124 |
| HLTH_SURVEY_CANADA   Canada Health Survey                     *Data    352 |
| ICB_1975_76_ECONOMIC Illegal Corporate Behavior, 1975-76: EAD *Data    128 |
| ICB_1975_76_SANCTION Illegal Corporate Behavior, 1975-76: V/S *Data    175 |
| IFS_AFGHANISTAN      IFS Time Series for AFGHANISTAN          *TSF     121 |
| IFS_AFRICA           IFS Time Series for AFRICA               *TSF      33 |
| IFS_AFRICA_NOT_SPECI IFS Time Series for AFRICA NOT SPECIFIED *TSF       4 |
+----------------------------------------------------------------------------+
```

Browse MRDF Information Online

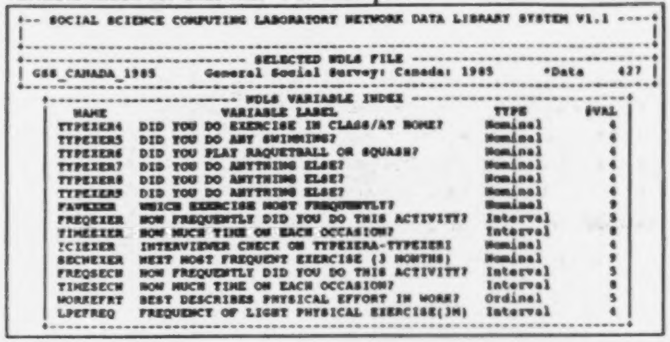
NDLS maintains codebook information and statistical summary profiles for files, variables and values. A typical file description screen is shown below.



```
+-- SOCIAL SCIENCE COMPUTING LABORATORY NETWORK DATA LIBRARY SYSTEM V1.1 ----+
|                                                                            |
+----------------------------------------------------------------------------+
+------------------------ NDLS FILE DESCRIPTION -----------------------------+
| File Name                   : GSS_CANADA_1985                  (PASSWORD)  |
| File Label                  : General Social Survey: Canada: 1985          |
| File Format                 : Raw Data                                     |
| Number of Variables         : 427                                          |
| Number of Logical Records   : 11200                                        |
| Number of Physical Records  : 11200                                        |
| Number of Disk Blocks       : 12294                          +------------ |
| Date of Last Modification   : 11-APR-1989 12:16:18.00       | Line :    1 |
|--------------------------------------------------------------+------------|
|                                                                            |
|                    Table of Contents                            Line       |
|     1.      INTRODUCTION ........................................ 36       |
|     2.      OBJECTIVES .......................................... 52       |
|     3.      POPULATION .......................................... 92       |
|     4.      SURVEY DESIGN ...................................... 113       |
|     4.1     TELEPHONE SAMPLE (WAKSBERG DESIGN) PERSONS 15-64               |
|             (PEI, NS, NB, QUE, MAN, SASKA, ALTA, BC) ........... 135       |
|     4.2     TELEPHONE SAMPLE (ELIMINATION OF NON-WORKING                   |
|             BANKS DESIGN) PERSONS 15-64 (NFLD & ONT) ........... 186       |
+----------------------------------------------------------------------------+
```

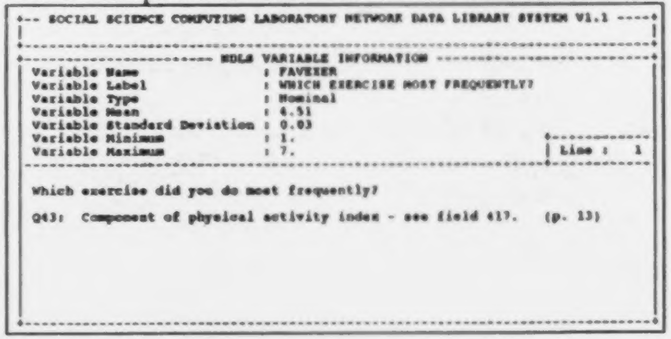
Most screens in NDLS consist of one or more static displays at the top of the screen plus a scrollable lower portion which the user may navigate by using cursor keys.

When the user selects a file from the file index, NDLS displays the variable index for that file. For example:



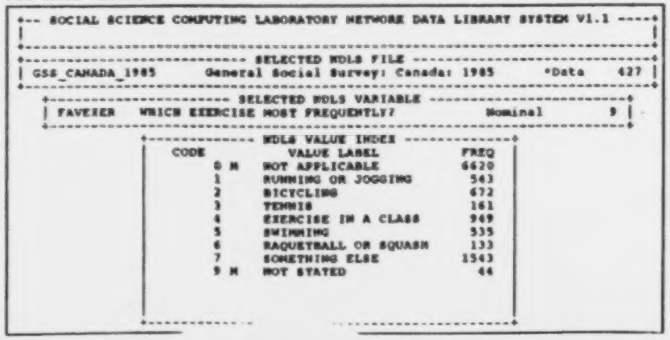
```
+-- SOCIAL SCIENCE COMPUTING LABORATORY NETWORK DATA LIBRARY SYSTEM V1.1 ----+
|                                                                            |
+----------------------------------------------------------------------------+
+------------------------- SELECTED NDLS FILE -------------------------------+
| GSS_CANADA_1985      General Social Survey: Canada: 1985      *Data    427 |
+----------------------------------------------------------------------------+
   +---------------------- NDLS VARIABLE INDEX ----------------------------+
   |  NAME               VARIABLE LABEL                   TYPE       #VAL |
   | TYPEXER4  DID YOU DO EXERCISE IN CLASS/AT HOME?      Nominal       4 |
   | TYPEXER5  DID YOU DO ANY SWIMMING?                   Nominal       4 |
   | TYPEXER6  DID YOU PLAY RAQUETBALL OR SQUASH?         Nominal       4 |
   | TYPEXER7  DID YOU DO ANYTHING ELSE?                  Nominal       4 |
   | TYPEXER8  DID YOU DO ANYTHING ELSE?                  Nominal       4 |
   | TYPEXER9  DID YOU DO ANYTHING ELSE?                  Nominal       4 |
   | FAVEXER   WHICH EXERCISE MOST FREQUENTLY?            Nominal       9 |
   | FREQEXER  HOW FREQUENTLY DID YOU DO THIS ACTIVITY?   Interval      5 |
   | TIMEEXER  HOW MUCH TIME ON EACH OCCASION?            Interval      8 |
   | ICIEXER   INTERVIEWER CHECK ON TYPEXERA-TYPEXERI     Nominal       4 |
   | SECNEXER  NEXT MOST FREQUENT EXERCISE (3 MONTHS)     Nominal       9 |
   | FREQSECN  HOW FREQUENTLY DID YOU DO THIS ACTIVITY?   Interval      5 |
   | TIMESECN  HOW MUCH TIME ON EACH OCCASION?            Interval      8 |
   | WORKEFRT  BEST DESCRIBES PHYSICAL EFFORT IN WORK?    Ordinal       5 |
   | LPEFREQ   FREQUENCY OF LIGHT PHYSICAL EXERCISE(3M)   Interval      4 |
   +----------------------------------------------------------------------+
```

Further descriptive information is available for each variable:



```
+-- SOCIAL SCIENCE COMPUTING LABORATORY NETWORK DATA LIBRARY SYSTEM V1.1 ----+
|                                                                            |
+----------------------------------------------------------------------------+
+---------------------- NDLS VARIABLE INFORMATION ---------------------------+
| Variable Name                 : FAVEXER                                    |
| Variable Label                : WHICH EXERCISE MOST FREQUENTLY?            |
| Variable Type                 : Nominal                                    |
| Variable Mean                 : 4.51                                       |
| Variable Standard Deviation   : 0.03                                       |
| Variable Minimum              : 1.                           +------------ |
| Variable Maximum              : 7.                           | Line :    1 |
|--------------------------------------------------------------+------------|
|                                                                            |
| Which exercise did you do most frequently?                                 |
|                                                                            |
| Q43:  Component of physical activity index - see field 417.     (p. 13)   |
|                                                                            |
|                                                                            |
|                                                                            |
|                                                                            |
+----------------------------------------------------------------------------+
```

When the user selects a variable, NDLS provides value information for that variable:



```
+-- SOCIAL SCIENCE COMPUTING LABORATORY NETWORK DATA LIBRARY SYSTEM V1.1 ----+
|                                                                            |
+----------------------------------------------------------------------------+
+------------------------- SELECTED NDLS FILE -------------------------------+
| GSS_CANADA_1985      General Social Survey: Canada: 1985      *Data    427 |
+----------------------------------------------------------------------------+
   +--------------------- SELECTED NDLS VARIABLE --------------------------+
   | FAVEXER   WHICH EXERCISE MOST FREQUENTLY?            Nominal       9 |
   +----------------------------------------------------------------------+
              +------------ NDLS VALUE INDEX -----------------+
              |  CODE           VALUE LABEL            FREQ   |
              |        0 M   NOT APPLICABLE            6620   |
              |        1     RUNNING OR JOGGING         543   |
              |        2     BICYCLING                  672   |
              |        3     TENNIS                     161   |
              |        4     EXERCISE IN A CLASS        949   |
              |        5     SWIMMING                   535   |
              |        6     RAQUETBALL OR SQUASH       133   |
              |        7     SOMETHING ELSE            1543   |
              |        9 M   NOT STATED                  44   |
              |                                               |
              |                                               |
              +-----------                -------------------+
```

Details for Acquiring NDLS

There are numerous approaches and techniques for computerization of a Data Resources Library, including the development of sophisticated retrieval systems for hands-on use by library patrons. Such planning is usually very site specific and tied to the availability of system resources, costing of those resources, availability of human resources, and generally the importance that is placed on the provision of MRDF services within the institution.

NDLS was developed specifically as an academic and research support system for use at the University of Western Ontario. Until now, it has not been sold or otherwise promoted for sale to other institutions. Western will be pleased to confer with any ICPSR site which is interested in acquiring NDLS for their own use. Availability of a commercial version of NDLS and pricing for the software, utilities and maintenance support is currently being established.

Please direct enquiries for pricing and technical information to either Les Flodrowski or Diane Crowther at the address and telephone number listed on the front of this brochure.

NDLS Users' Group

Since there is considerable time and effort required in the preparation of MRDFs for inclusion in the NDLS system, trading sharing or selling MRDF information in an NDLS preload format is one method for Data Librarians to speed the process. The exchange or redistribution of the raw data files themselves is usually prohibited - data files must be obtained only from the original distribution source.

Select Data Sets Online

Users can browse file information online and interactively specify desired variables and values in order to select a subset of the cases into a manageable MRDF for analysis. Values can be selected either individually or by using boolean logic. During the NDLS session, the user may also request appropriate data description statements for SPSS-X, SAS, BMDP, and TSP.

Begin Analysis Immediately

The selected data set is retrieved automatically from a data library (currently tapes) and returned to the user's disk area in raw data format. Requested data definitions are returned in separate files. The user may begin analysis of the data immediately by simply editing the data definition file to include appropriate procedure statements.

Other Online Features

Online help is available within NDLS, and the current screen display can be output to a file at any time during a session.

NDLS Management Utilities

With the NDLS management utilities, the Data Librarian can perform the following tasks:

- prepare new MRDFs for inclusion in NDLS
- transform IFS data into TSP format
- generate usage statistics
- provide password protection for individual MRDFs

System Requirements

Any VAX/VMS system which meets the following specifications:

- Operating System: VAX/VMS 5.2
- Storage Media: 50MB of hard disk capacity for storage of the online index and management software; 8 mm high capacity tape cartridge, or 6250 bpi reel tape storage for raw data files
- **Main Memory:** 8MB total
- **Terminal:** VT200, or microcomputer with VT220 terminal emulation software, for online browsing and MRDF [illegible]ment

S S C L
Social Science Computing Laboratory

. . . providing computing services, networking, and software support in the Faculty of Social Science

Telephone Numbers

General Enquiries	(519) 661-2152
VAX(R), VAX(W) dial-up	(519) 661-2155
VAX(I) dial-up	(519) 661-2158

Electronic Mail Addresses

Netnorth	SSCL@VAXI . SSCL.UWO . CA
Bitnet	SSCL@UWOVAX . BITNET

Faculty of Social Science
The University of Western Ontario
London, Ontario, Canada, N6A 5C2

Hours of Operation

Winter Hours
September-April

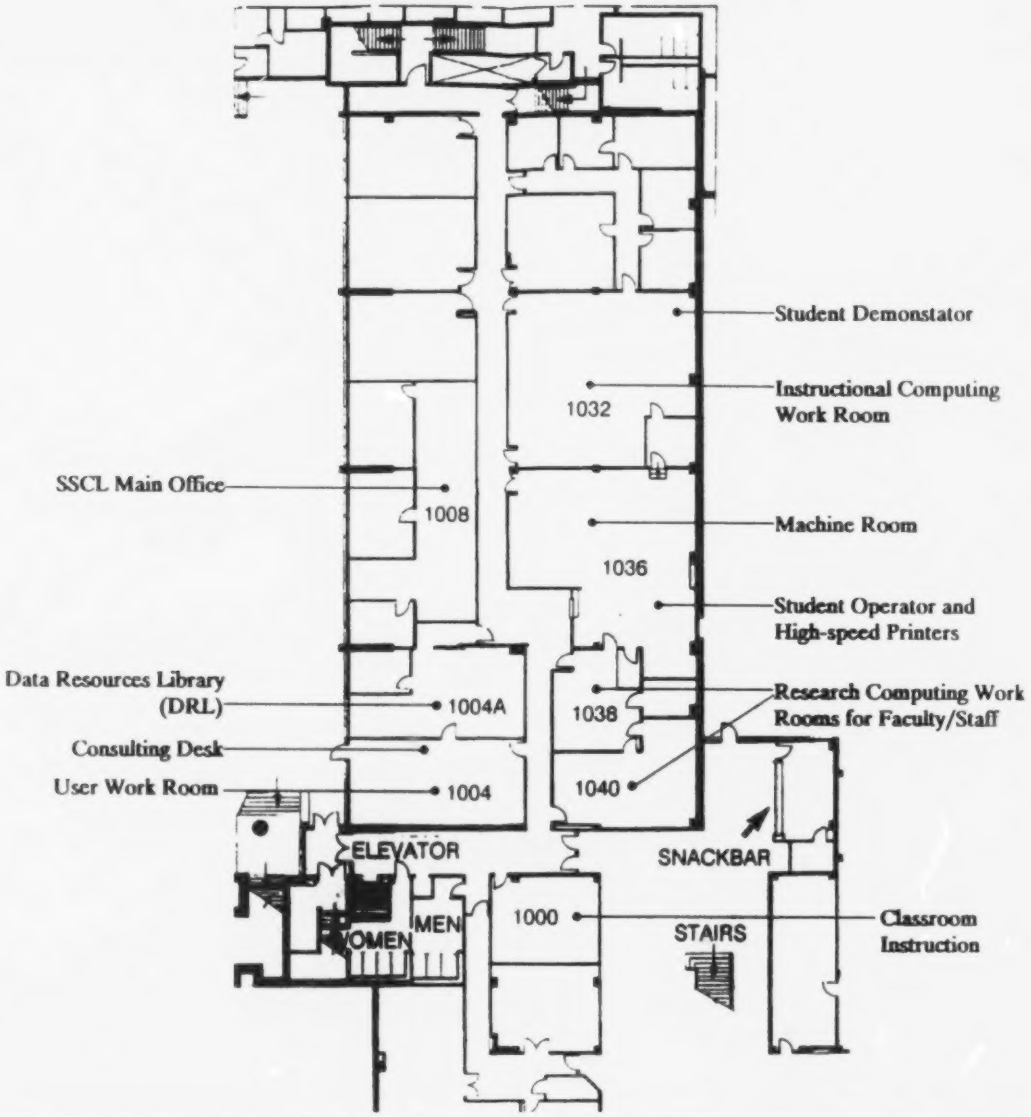
	Sun	Mon	Tues	Wed	Thur	Fri	Sat
User Work Rooms	13:00-22:00	8:30-23:00	8:30-23:00	8:30-23:00	8:30-23:00	8:30-18:00	9:00-17:00
Consulting Desk	closed	9:30-16:30	9:30-16:30	9:30-16:30	9:30-16:30	9:30-16:30	closed
Student Demonstrator	closed	9:30-22:30*	9:30-22:30*	9:30-22:30*	9:30-22:30*	9:30-16:30	closed
Data Resources Library	closed	9:00-17:00	9:00-17:00	9:00-17:00	9:00-17:00	9:00-17:00	closed
SSCL Main Office	closed	8:30-17:00	8:30-17:00	8:30-17:00	8:30-17:00	8:30-17:00	closed

* During these periods, the Student Demonstrator in Room 1032 will be unavailable from 17:00 to 18:30

Summer Hours
May - August

	Sun	Mon	Tues	Wed	Thur	Fri	Sat
User Work Rooms	closed	9:00-21:00	9:00-21:00	9:00-21:00	9:00-21:00	9:00-17:00	9:00-17:00
Consulting Desk	closed	10:00-16:00	10:00-16:00	10:00-16:00	10:00-16:00	10:00-16:00	closed
Student Demonstrator	closed	closed	closed	closed	closed	closed	closed
Data Resources Library	closed	9:00-17:00	9:00-17:00	9:00-17:00	9:00-17:00	9:00-17:00	closed
SSCL Main Office	closed	8:30-17:00	8:30-17:00	8:30-17:00	8:30-17:00	8:30-17:00	closed

SSCL Floor Plan and Room Locations


Student Demonstator
Instructional Computing Work Room
1032
SSCL Main Office
1008
Machine Room
1036
Student Operator and High-speed Printers
Data Resources Library (DRL)
1004A
1038
Research Computing Work Rooms for Faculty/Staff
Consulting Desk
User Work Room
1004
1040
ELEVATOR
SNACKBAR
WOMEN
MEN
1000
Classroom Instruction
STAIRS

SSCL Serving You ...

Established in 1972, SSCL serves the Faculty of Social Science by integrating computing facilities, expertise, data resources, and work space for the support of computer-based research and instruction in the social sciences and related fields. SSCL also undertakes research and development contracts for government and other organizations. Services are organized into four programme areas: User Services, Information Systems, Systems and Applications, and Administration.

SSCL provides an excellent selection of statistical and computational software, online bibliographic and data retrieval systems, document preparation systems, custom utilities and hardware resources for the social science community. This collection of software, hardware and SSCL services is referred to as the *SSCL Computing Environment*. The environment is built upon a cluster of DEC VAX computers and Zenith 286 microcomputers, all networked together via the high-speed Social Science Centre (SSC) building network. The SSC Network uses Ethernet technology and DEC's PCSA software allowing PCs in the building to connect to the network and use SSCL microcomputer and mainframe-based services. Connection hardware, required to network PCs in social science offices and labs, may be purchased outright, or rented. Anyone with their own PC who wishes to utilize these network services should contact the SSCL main office at **Ext. 2152**.

The hub of the SSCL Network consists of four mainframe computers each providing mainframe processing and network services. ***VAX(R)*** is dedicated to *research* activities; ***VAX(I)*** is dedicated to *instructional* activities and SSCL support functions; *VAX(W)* is dedicated to *word processing* and *document preparation;* and *VAX(S)* is a dedicated *network server* and *batch processing engine*. SSCL also provides network access to computing resources at CCS including the VAX6330, CYBER930, and the ETA10-P class VI supercomputer.

Computing Resources

Providing Quality Computers and Peripherals

- *VAX Mainframes*
- *VT220-type Terminals*
- *Colour Pen Plotter*
- *High-speed Printers*
- *Optical Page Scanner*
- *Zenith 286 Workstations*
- *Laser Printers*
- *Graphics Printers*
- *Low-speed Printers*
- *Optical Card Reader*
- *Rental of Connection Hardware to SSC Network*

Instructional Facilities

Teaching Facilities for Faculty, Staff, Students

- ***Short Courses*** - free instruction on using SSCL computing facilities and software. Courses are offered in the fall, winter and spring terms
- ***Seminar Room*** - seats 35 students. Equipped with PC, VT220, monitors & online projection system
- ***Teaching Aids*** - provided to instructors and TAs whose students use SSCL computing facilities

Custom SSCL Software

Enhancements to the Computing Environment

- ***Network Data Library System*** - online access, browsing and retrieval of social science data files
- ***Marks Management System*** - computerized system for recording, tracking & submitting student marks
- ***GRAPHICS*** - an easy-to-use VAX utility used to create a variety of high-quality graphs and charts
- ***ARCHIVE*** - stores personal files offline on magnetic tape. Files are restored on request within 24-hours
- ***SCRATCH*** - allows users to request large amounts of online disk storage for specified time periods

Information Resources

Sources of Information to Assist SSCL Users

The Data Resources Library (DRL)

- Books, manuals, data file codebooks, journals and newsletters are available for reference and loan
- Data acquisition from International Consortium for Political & Social Research (ICPSR)
- Data acquisition from Canadian Association of Research Libraries (CARL) 1986 Census consortium
- Time series data from Canadian Socio-Economic Information Management system (CANSIM)
- Access to documentation published by SSCL
- Access to Privacy Act & Access to Information Act

CD-ROM Network Information Services

Microcomputer workstations on the SSC Network have online access to Compact Disk (CD-ROM) services:

- *The New Grolier Electronic Encyclopedia*
- *Microsoft Bookshelf*
- *PC-SIG Library*
- *Microsoft Programmer's Library*
- *National Longitudinal Survey of Youth*

Additional Information and Assistance

- *Consulting Desk* - located in Room 1004, provides assistance from SSCL specialists and statisticians
- *Manual Racks* - up-to-date documentation located in SSCL work rooms
- *Bulletin Boards* - provide tips using mainframe and microcomputer software and procedures
- *Online HELP and Tutorials* - allow users to work at their own speed while using computing facilities

Commercial Software

PC and VAX-based Application Software

Statistical Packages

- *SPSS-X*
- *SPSS/Tables*
- *SAS*
- *SAS/GRAPH*
- *SAS/ETS*
- *BMDP*
- *EQS*
- *Balanova*
- *MicroTSP*
- *SPSS/PC+*
- *SPSS/Data Entry II*
- *SAS/STAT*
- *SAS/IML*
- *Minitab*
- *IMSL*
- *Shazam*
- *TSP*
- *PC CARP*

Document Preparation

- *WordPerfect*
- *Nota Bene*
- *uTeX*
- *uLaTeX*
- *MAXview (Preview)*
- *DVI Laser/HP*
- *PageMaker*
- *TeX*
- *LaTeX*
- *Mappit*
- T^3
- *DVI Laser/PS*

Programming Languages

- *BASIC*
- *FORTRAN*
- *Macro Assembler*
- *GAUSS*
- *Quick BASIC*
- *Quick C*
- *Turbo C*

Database Management Packages

- *BASIS*
- *DataPerfect*
- *dBASE IV*

Integrated Spreadsheets

- *Lotus 1-2-3*
- *Excel*

Graphics

- *Harvard Graphics*
- *MS-Chart*

Registre Canadien
de la
Recherche et des Chercheurs
en Sciences Sociales

Description

Le Registre canadien de la recherche et des chercheurs en sciences sociales (Le Registre des sciences sociales) est une base de données polyvalente pouvant répondre à des requêtes de nature variée dans le domaine des sciences sociales au Canada. La base est constituée d'informations fournies directement par les chercheurs et les chercheures et est régulièrement mise à jour grâce à leur concours. Le Registre a pour fonction de promouvoir et de faciliter la communication d'informations de nature scientifique au sein de la communauté des sciences sociales au Canada. Il sert aussi à mettre les chercheurs et les chercheures en relation avec des organismes qui voudraient recourir à leurs services ou prendre connaissance des résultats de la recherche en sciences sociales.

Le Registre contient des informations non seulement sur les domaines relevant traditionnellement des sciences sociales, mais aussi sur la recherche en droit, en éducation, en gestion, en relations industrielles, sur les études sur le travail, les études urbaines, les études régionales, les études sur l'environnement, les études régionales ou nationales, l'économie domestique, la bibliothéconomie, le journalisme et le travail social.

Le Registre tient à remercier le Conseil de recherches en sciences humaines du Canada, la Fédération canadienne des sciences sociales, la Bibliothèque nationale du Canada et l'université Western Ontario pour leur appui financier, ainsi que les membres du comité consultatif du Registre pour leur temps et pour leurs conseils.

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Canadian Register
of Research and Researchers in the Social Sciences

Information Brochure

The Canadian Register of Research and Researchers in the Social Sciences (the Social Science Register) is a multi-dimensional, multi-purpose national information system that has been constructed and is maintained from career data collected directly from social scientists. The overall purpose of the Register is to support and promote the communication of scientific information within the social science community in Canada, as well as between social scientists and organizations which require their expertise or the results of social science research.

In addition to the disciplines traditionally identified with a social science faculty, the Register includes researchers in law, education, management sciences, labor and industrial relations, urban, rural and environmental studies, regional and national studies, home economics, library science, journalism and social work.

The Register gratefully acknowledges the financial assistance of the Social Science and Humanities Reseach Council, Social Science Federation of Canada, National Library of Canada and the University of Western Ontario. In addition, the Advisory Board members contribute their time and expertise to the Register.

© 1990, Canadian Register of Research and Researchers in the Social Sciences

Register Advisory Board

The Advisory Board's terms of reference include the review of the development and future operation of the Register and the provision of advice and guidance that will contribute to the professional stature, integrity, and usefulness of the Register to the social science community in Canada. The Advisory Board consists of the following members:

Horst K. Betz, Chairman
Register Advisory Board
Department of Economics
University of Calgary

John G. Adair
Department of Psychology
University of Manitoba

Elinor W. Ames
Department of Psychology
Simon Fraser University

Marshall W. Conley
Office of Graduate Studies
and Research
Acadia University

David H. Flaherty
Department of History
University of Western Ontario

William B. Hamilton
Department of Education
Mount Allison University

José Igartua
Département d'histoire
Université du Québec à
Montréal

Barry D. McPherson
Dean of Graduate Studies
Wilfrid Laurier University

John Meisel
Department of Politial Science
Queen's University

What is the Register?

Each record in the Register is created from a questionnaire completed by a social scientist. The participants' records consist of four main sections:

I. Biographical Information
II. Professional Qualifications
III. Current Research Project(s)
IV. Selective Publication(s)

The tables on the next page show the distribution of Register participants by Province of Residence, Employment Sector and Primary Discipline.

Distribution of Participants by Province of Residence

British Columbia	768	9.3%
Northwest Territories	22	0.3%
Yukon	7	0.1%
Alberta	713	8.7%
Saskatchewan	271	3.3%
Manitoba	331	4.0%
Ontario	3,470	42.2%
Quebec	1,505	18.3%
New Brunswick	208	2.5%
Nova Scotia	351	4.3%
Prince Edward Island	28	0.3%
Newfoundland	145	1.8%
Residing outside Canada	401	4.9%
Total	8,220	100.0%

Distribution of Participants by Employment Sector

Academic	6,206	75.5%
Federal Government	429	5.2%
Provincial Government	630	7.7%
Other Government	166	2.0%
Private Industry/Self-Employed	360	4.4%
Non-profit Research Institutes	197	2.4%
Unemployed/Full-time Students	232	2.8%
Total	8,220	100.0%

Distribution of Participants by Primary Discipline

Anthropology/Archaeology	351	4.2%
Area/National/Regional/Urban /Rural/Community/Native/ Development Studies	242	2.9%
Biomedical Ethics/Health Sciences	72	0.9%
Business Administration	735	8.9%
Canadian Studies	93	1.1%
Economics	810	9.9%
Education	999	12.2%
Geography/Environmental Studies	461	5.6%
History	645	7.8%
Humanities	207	2.5%
Law/Industrial and Labour Relations	415	5.0%
Leisure Studies/Human Kinetics	185	2.3%
Library and Information Science /Linguistics	210	2.6%
Political Science/Public Policy & Admin/ International Affairs	573	7.0%
Psychology	1,272	15.5%
Social Services/Social Work /Gerontology	180	2.2%
Sociology/Demography/Criminology	654	8.0%
Other	116	1.4%
Total	8,220	100.0%

Participation

The Register, in operation since September, 1982, contains information contributed by more than 8,000 social scientists. The database includes information on over 9,500 research projects and 31,100 publications, as reported by Canadian social scientists in government, universities, independent research organizations, and private industry. National in scope, a good cross-section of researchers in all social science fields are included. In April, 1985 a Sub-Register for Biomedical Ethics was established.

After completing the Register questionnaire, participants' records are kept current by biennial updates. During updates participants are sent a computer-generated report on the content of their Register record with an invitation to review, correct, update and provide additional information about the evolution of their career.

Registration Kits

New participants are always welcome to join the Register. There is no charge for being a participant and you will become part of a national information system dedicated to sharing research in the social science community. Complete the following details to request a registration kit or to revise your mailing address. Please return this form to the address at the back of the brochure: (Please print clearly)

( ) This is a change of address.

( ) Please send a Registration Kit.

Name: ____________________

Address: ____________________

____

____

Telephone: ____________________

Electronic Mail: ____________________

Information Services

CAN/OLE

The National Library of Canada sponsors a Register sub-base called CANREG on the Canadian On-Line Enquiry System (CAN/OLE). CAN/OLE provides access to many Canadian content databases and is available at most research libraries. CANREG focuses on areas of specialization, publications and research projects. This sub-base is updated quarterly and contains over 5,900 records.

CD-ROM

The first CD-ROM version of the Register is under development and is expected to be released by December, 1990. This new format combines extensive indexing of the information with powerful and easy to use retrieval software. Individual researchers and organizations in the social science community will be able to purchase the disc and use it for unlimited and self-directed searching. Please contact the Social Science Computing Laboratory (SSCL) for information on pricing and availability.

Custom Information Services

SSCL offers a range of custom information services including custom searches, custom report formatting, generation of mailing labels, high quality camera-ready copy, statistical analyses and other services designed to supplement the information available on the CD-ROM version. Custom services include the screening of both search requests and results. Though the entire database is used for custom services, clients may request only that information which updates the CD-ROM data.

Use this form to request additional information.

Name: ______________________________

Address: ______________________________

____

____

Telephone: ______________________________

Electronic Mail: ______________________________

The University of Western Ontario

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Social Science Computing Laboratory
Faculty of Social Science
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MARKETING AND PUBLICITY

ASSOCIATION OF RESEARCH LIBRARIES

OFFICE OF MANAGEMENT SERVICES

Explore scientific data with apE software

Available at Computer Visualization Laboratory

by Roland Schweitzer, Advanced Technical Computing Support

apE, a software tool kit for visualization, is now available at the ACNS Computer Visualization Laboratory (CVL). apE lets you explore scientific and engineering data using plots, color images and three-dimensional objects.

apE is a dataflow environment, where the user builds processing pipelines through a visual interface as shown in the sample screens below. Data flowing through the pipeline undergoes various transformations, such as scaling, color mapping and isosurface generation, until it is finally rendered as an image on the screen.

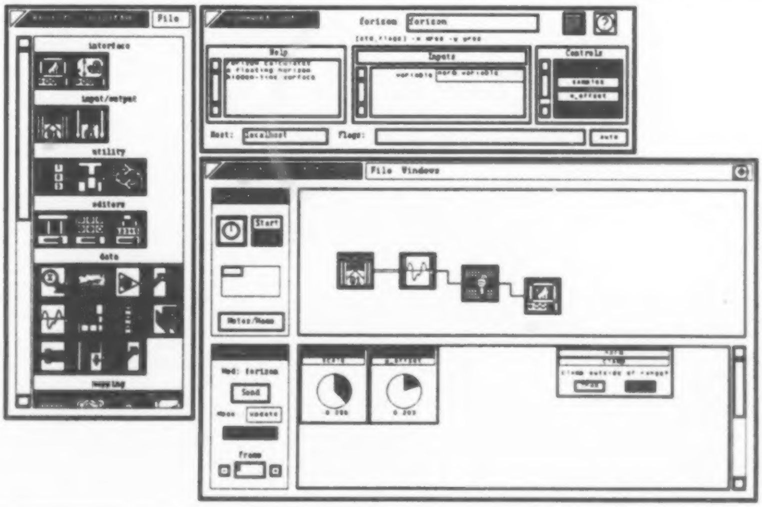
The type of image produced can be manipulated in various ways, such as changing the order or content of a pipeline or manipulating control knobs associated with pipeline elements.

apE is developed and maintained by the Ohio Supercomputer Center Graphics project and Ohio State University holds the copyright. However, the system is open and widely available. The CVL has obtained a license for several machines in the laboratory, and the software is now available for general use.

apE adds several capabilities to the CVL, as well as providing alternatives for many of the visualization techniques previously available. In particular, multiple isosurfaces of three-dimensional data can be generated with transparency. Particle traces through three-dimensional flow fields are also available. Vector-valued data can be rendered via arrows that display magnitude and direction. Facilities are available for making two-dimensional raster images like those from NCSA Image. Surface renderings are also possible, similar to those created by the NCSA Height-Color Visualizer.

As with all new software releases, apE has a few deficiencies. The complexity of the user interface windows can be intimidating, but the release materials include an excellent set of tutorial sessions. The software is somewhat slow, even on fast graphics workstations, so some patience is required to avoid swamping the machine with requests.

Interested users are encouraged to stop by the CVL to try out the new software. ☐



This graphic shows three windows of the apE software. The lower right window is split into two parts. The top part shows a completed dataflow pipeline. The bottom part shows the control knobs associated with the pipeline elements. The vertical window on the left shows the pieces from which the pipeline is built. The user enters information about the pipeline in the top window.

CSUNet ties campus together

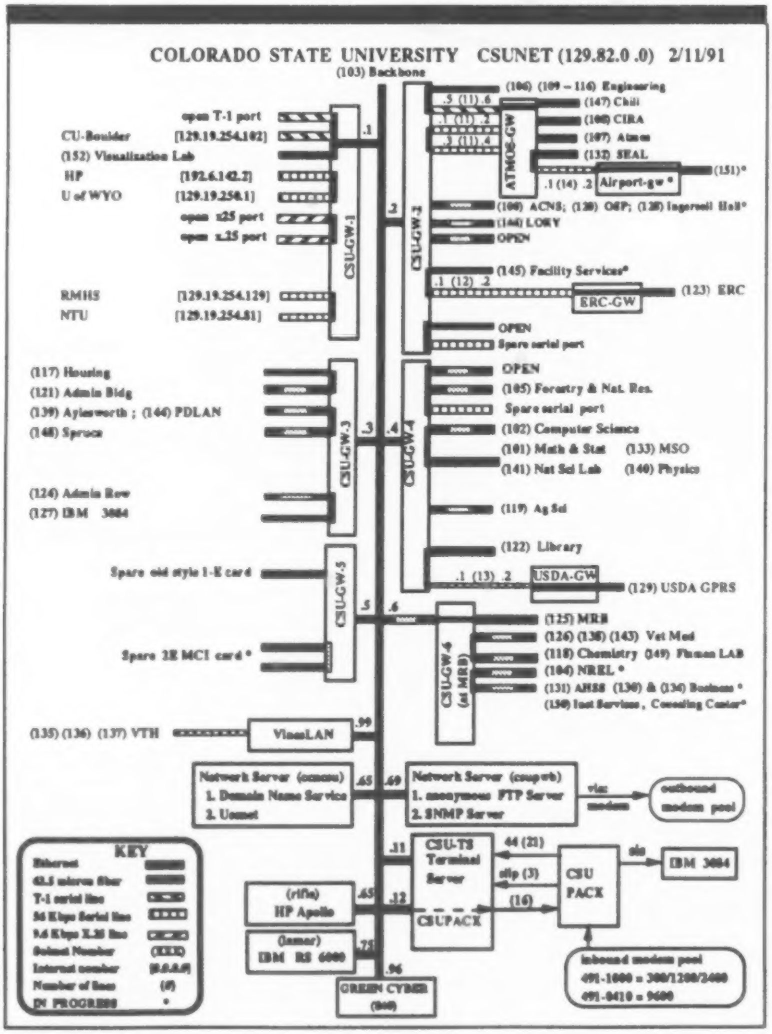
by Michael Moravan, CSUNet Project Manager, 491-7432

The campus network, CSUNet, now provides networking services to most of the campus, including nearly all administrative units and seven of the eight colleges. Only the College of Applied Human Sciences (AHS) and the dormitories are not yet connected to CSUNet.

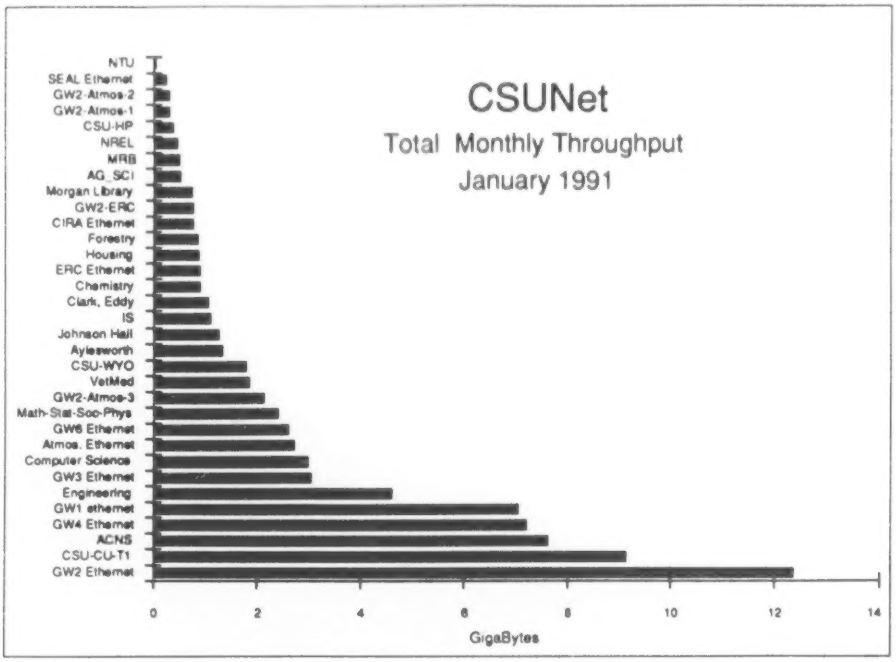
Academic Computing and Networking Services (ACNS) is currently working with the College of Applied Human Sciences to formulate a plan to connect the Gibbons, Guggenheim, Industrial Science and Occupational Therapy buildings, the Gifford and Education buildings, and Moby Gym and the Student Recreation Center to CSUNet.

ACNS is also working with the Housing Department to bring CSUNet services to the dormitories. By the time this article is published, the Ingersoll Hall PC-MAC lab should be connected to CSUNet via a 56K bps serial line.

Later this fall, high-speed, in-room Ethernet connections will be offered on a trial basis to Allison students. If the Allison experiment is successful, CSUNet will eventually be extended to other dorms.


COLORADO STATE UNIVERSITY CSUNET (129.82.0 .0) 2/11/91
(103) Backbone
open T-1 port
CU-Boulder [129.19.254.102]
(152) Visualization Lab
HP [192.6.142.2]
U of WYO [129.19.250.1]
open x25 port
open x.25 port
RMHS [129.19.254.129]
NTU [129.19.254.81]
CSU-GW-1
.1
.2
CSU-GW-2
(106) (109 – 116) Engineering
.5 (11) .6
(147) Chili
.1 (11) .2
(108) CIRA
.3 (11) .4
(107) Atmos
(132) SEAL
ATMOS-GW
.1 (14) .2
Airport-gw *
(151)*
(100) ACNS; (120) OSP; (128) Ingersoll Hall*
(144) LORY
OPEN
(145) Facility Services*
.1 (12) .2
ERC-GW
(123) ERC
OPEN
Spare serial port
(117) Housing
(121) Admin Bldg
(139) Aylesworth ; (144) PDLAN
(148) Spruce
(124) Admin Row
(127) IBM 3084
CSU-GW-3
.3
.4
CSU-GW-4
OPEN
(105) Forestry & Nat. Res.
Spare serial port
(102) Computer Science
(101) Math & Stat (133) MSO
(141) Nat Sci Lab (140) Physics
(119) Ag Sci
(122) Library
.1 (13) .2
USDA-GW
(129) USDA GPRS
Spare old style 1-E card
Spare 2E MCI card *
CSU-GW-5
.5
.6
CSU-GW-6 (at MRB)
(125) MRB
(126) (138) (143) Vet Med
(118) Chemistry (149) Fluman LAB
(104) NREL *
(131) AHSS (130) & (134) Business *
(150) Inst Services, Counseling Center*
(135) (136) (137) VTH
VinesLAN
.99
Network Server (csnews)
1. Domain Name Service
2. Usenet
.65
.69
Network Server (csupwb)
1. anonymous FTP Server
2. SNMP Server
via modem
outbound modem pool
.11
CSU-TS Terminal Server
44 (21)
slip (3)
(16)
CSU PACX
sio
IBM 3084
CSUPACX
(rifle) HP Apollo
.65
.12
(lamar) IBM RS 6000
.75
.96
GREEN CYBER (840)
inbound modem pool
491-1000 = 300/1200/2400
491-0410 = 9600
KEY
Ethernet
62.5 micron fiber
T-1 serial line
56 Kbps Serial line
9.6 Kbps X.25 line
Subnet Number (XXX)
Internet number [0.0.0.0]
Number of lines (#)
IN PROGRESS *

This diagram shows the current configuration of CSUNet, the University's own high-speed data network. Special purpose gateway computers connect local college and department subnets to a central Ethernet cable (subnet 103). This central Ethernet cable, also called the backbone, can transmit 10 million bits of data per second. CSUNet connects these local college and department subnets to one another and to other regional and national networks.



This chart shows the total amount of traffic flowing IN and OUT of a particular Ethernet; local traffic that does not exit the Ethernet is NOT included in these figures.

The diagram on Page 10 shows how various cisco gateways (labeled CSU-GW-1, CSU-GW-2, etc.) are connected to a central Ethernet backbone. The local college and department subnets are connected to the backbone through the gateways. Central computing resources such as the CYBER 840, the IBM 3084, the CSU PACX and terminal server, and the inbound and outbound modem pools are also connected to CSUNet.

During the last year, the following units have purchased a connection to CSUNet: Chill Radar at the Atmospheric Science building, Continuing Education at Spruce Hall, the Lory Student Center, various departments in Aylesworth Hall and the Student Health Center, Facilities Services in the Facilities Services Center, the USDA Great Plains Research Center at 1701 Center Avenue, the college of Agricultural Sciences (serving Shepardson, Animal Health, Plant Science and portions of the Clark building), and units of Atmospheric Science located at Christman Field.

As you might guess by the number of colleges and departments connected to it, CSUNet already carries a tremendous amount of traffic, and its usefulness will continue to grow as more units connect to it.

The chart at the top of this page shows CSUNet's total monthly throughput for January 1991. This chart reflects the total amount of traffic flowing IN and OUT of a particular Ethernet; local traffic that does not exit the Ethernet is NOT included here.

For example, the Computer Science Ethernet (subnet 102), which is connected to the cisco router, labeled CSU-GW-4, sent and received about 3.2 billion characters during the month of January 1991. The IBM 3084 on the Information Systems Ethernet (subnet 127), which is connected to the cisco router, labeled CSU-GW-3, sent and received about 600,000,000 characters during the same period.

In January 1991, the busiest connection on campus was the GW2 interface that connects the cisco router, labeled CSU-GW-2, to subnet 103 (the backbone). According to the chart this interface sent and received nearly 12.4 billion characters in one month!

If you have questions about CSUNet, you may call me at 491-7432 or send electronic mail to `moravan@colostate.edu`. ☐

November 1990

TECOR NOTES

News & Ideas from CIRT's Technical Coordinators' Roundtable

The Dartmouth College Information System

Dartmouth College Library and Dartmouth Computing Services are developing an integrated scholarly information retrieval system, known as the Dartmouth College Information System (DCIS). DCIS combines windowed user interface programs, database servers, a high-speed network, and a wide variety of information resources, to provide immediate and easy access to a wide variety of information through the user's workstation. Information access is integrated into the word-processing environment at the users' workstation.

DCIS is designed to include data from a variety of sources: reference material such as dictionaries and encyclopedias, indexes to library collections and the journal literature, scholarly resources such as *The Oxford English Dictionary*, institutional resources such as the newspaper, numeric databases, graphic data, and administrative data such as class lists, budgets, and schedules. Interlibrary connections with other institutions are also being developed. The project is developing tools to make computer databases from all over the campus more readily accessible and to simplify their ongoing maintenance. The system will locate and access the database selected without the user being aware of its location or connection process.

Institutional databases are distributed across a variety of mainframes and other database servers, which use a variety of operating systems and database management systems. The DCIS programs solve the inherent access problems, allowing the user to ignore the details of access and to concentrate on working with the data. The client and server computers can communicate over both local and wide area networks, allowing those not physically on the campus to make use of DCIS information resources. These resources are also available at any time.

Components of the project include developing user interfaces, designing and implementing the communication protocols between the user interface and the databases, designing database creation and maintenance tools to accommodate data providers not affiliated with the Library or Computing, enhancing the Kiewit Network to support the requirements of DCIS, acquiring new scholarly data resources, and acquiring hardware to support new data stores.

There are some emerging international standards in the area of search and retrieval protocols, namely NISO Z39.50 and ISO SR. This sort of standardization should allow similar access to data bases at other institutions over the Internet. The DCIS project is participating in efforts to develop implementations of Z39.50 to support such interchanges. Presently we are using a locally developed transaction oriented presentation level protocol called InfoSpeak. InfoSpeak was designed to facilitate access to heterogeneous information resources.

During the month of February 1990, the College Library received the DECSystem 5810 which serves as the primary host for the DCIS project. Bringing this system online is a major step forward for the project because of the large increase in available storage capacity and processor power compared to the previous installation.

There are a number of databases available in addition to the online catalog. Currently the following are available:

- Online Catalog (including books, orders, and serials)
- DartMed (subset of the MedLine biomedical journal literature)
- NH Newspapers
- Datafiles (machine readable information)
- Encyclopedia (*Academic American Encyclopedia* by Grolier)
- Playbill (theater programs)
- MESH (index of MedLine subject headings)
- Thespis (listing of the theatrical information files in the Williams/Watson Collection)
- GMAJ (sheet music collection)
- Shakespeare (text of 33 plays)
- Shakespeare's Sonnets

The Oxford English Dictionary and the PAT search engine developed at the University of Waterloo were acquired in May. *The American Heritage Dictionary* was acquired in September. The dictionary databases will be the next data sources publicly available.

At present we have implemented two viewer programs on the Macintosh which connect to the Library's Online System and a Social Science data base. The interface program to the Online System is currently being tested at the Library. It should be available on the Campus network shortly. A database directory Navigator, a viewer for SPSS and SAS data sets and several new servers are under construction. ❦

—*Robert Brentrup*

DCIS

Library File Server Administrator

All file servers need an administrator to keep order amongst the folders and to request extra space if necessary. Some time ago I was asked to serve as the Library File Server Administrator, and it looks like a good time to mention what my duties are and what the guidelines for using the file server are. Copied in its entirety below is the guidelines document from the file server:

Guidelines for use of the Library file server

1. All documents must be stored in folders. The "Guidelines" document is the only one that is not in a folder. Any stray documents will be put in the Lost and Found Folder for three months, then trashed.
2. *No documents should be used on the file server.* Copies should be moved to an individual's Macintosh, edited there, and then moved back to the file server. This has two advantages: it reduces network traffic and it removes the possibility of destroying the public copy when you make a mistake.
3. All documents on the file server should be locked.
4. Each committee has to manage what goes inside its folder. Any committee or working group is welcome to create a folder for its work.
5. All documents should have the creator, date of creation/modification, and the application used to create the document noted in their "Get Info" comment boxes.
6. Contact Corky Scott, Library File Server Administrator, if you have questions about any of these guidelines.

I don't know what else needs to be added, I do find the occasional loose document floating around without a home, but for the most part everyone seems to be using the file server as it was intended. If there are people reading this who haven't gotten into the file server and would like to, give me a call at x2562. ❦

—Corky Scott

DCLOS on DarTerminal: a shortcut

For many of us, the principal access to the Online Catalog is via DarTerminal on a Macintosh, using this icon:

The slower typists among us will be glad to know that up to ten frequently-used Online Catalog commands or responses can be preset so that they will appear on the screen after being called up by a single keystroke. Here's how:

1. Open DarTerminal and log on to the catalog as usual.
2. Open DarTerminal and select "Function keys" from the "Special" (or, in later versions, "Settings") menu.
3. Replace (just by typing over the highlighted — blackened — lines) the <x> markers with commands you frequently use, such as "SELect FILe ENCyclopedia" or "SET PAGing OFF." You can TAB from one line to the next, for a total of ten phrases.
4. When done, click on OK or press the Return key.
5. Open "Save settings" under the "File" (or, in later versions, "Settings") menu and name your customized DarTerminal application anything you want. (Those sharing DarTerminal disks might want to personalize their icon, e.g., "Joe's Cat" or "Sophie's Choice".) If later you decide to change the settings, just save the new version under the same name.

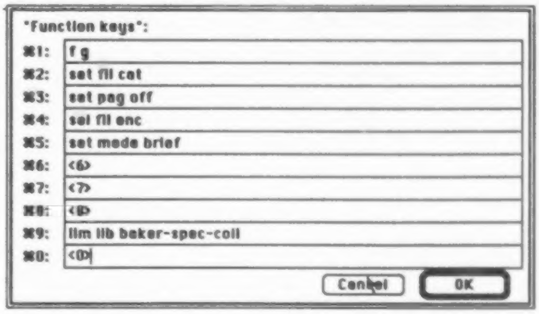
Now on your desktop you'll see a new icon with the DarTerminal symbol over the name you've just chosen. When you double-click on this to open a catalog session, the system will log you straight onto the catalog. By holding down the Command (flower) key and typing any number you will call up the command or other phrase you set in #3 above. Remember to press Return as usual to execute the command.

Illustrated below is the "Function Keys" setting I use.

#1 is short for FIND GENERAL, the most frequent searching command I use. #2 and #4 are for switching files. #3 turns off the paging. #5 turns off the menus. #9 is a frequently-used command to limit a search to material in Special Collections.

Those without photographic memories may need to have handy a listing of the function keys and their corresponding commands. Mine's taped to the front of the Mac. ❦

— Stan Brown



"Function keys":

⌘1: f g
⌘2: set fil cat
⌘3: set pag off
⌘4: sel fil enc
⌘5: set mode brief
⌘6: <6>
⌘7: <7>
⌘8: <8>
⌘9: lim lib baker-spec-coll
⌘0: <0>

TECOR NOTES is issued by the Technical Coordinators' Roundtable of the Dartmouth College Library's Committee for Information Resources and Technology. Edited by Debra Agnoli. Produced by Stanley Brown on a Macintosh SE and Laserwriter Plus using PageMaker 4.0. Fonts are Times, Helvetica, Zapf Chancery, and Zapf Dingbats.

KeyServer: Access to Commercial Software on an AppleTalk® Network

The Library Model

The integration of computers into the educational structure of Dartmouth College has been shaped by the library model for accessibility. Nearly a quarter century ago, the Dartmouth College Time Sharing system made history as the first to offer high-speed computer services simultaneously to many individuals at an educational institution. In the early 1980s, the introduction and subsequent proliferation of Macintosh computers at Dartmouth and the installation of the campus-wide AppleTalk network opened new possibilities for easy access to computing. Extensive network services developed, including 24-hour access to the College Library's On-line Catalog, connections to national and international networks, and free use of public file servers, laser printers, and electronic mail services.

Until now, however, access to commercial software has been limited to packages on the mainframe computer systems. Free and legal access to a large library of commercial software for the Macintosh computer has not been available. At issue has been the definition of "fair value" of a license for software to be used over an intricate network. Commercial vendors have expressed concern about the lack of control over, and the inability to monitor, the software usage.

Enter the KeyServer: a novel and exciting concept in network licensing. With the KeyServer, any of the nearly 6,000 Macintosh computers connected to Dartmouth's campus-wide network may have free access to a variety of commercial software for word processing, database management, spreadsheet development, statistical analyses, computer-aided design (CAD), graphics, and more.

The KeyServer Concept

Imagine a setting where the entire class of an engineering major, numbering in the hundreds, needs to use a sophisticated Macintosh CAD program to complete their course assignments. Use of the application will be intermittent, but nonetheless critical to the educational experience. The cost of a suitable, high-performance CAD package can exceed several thousand dollars — per copy. It is unrealistic to expect each student to purchase such software, and the usual license prohibits sharing the program among students or among computers.

With a minimal amount of technical manipulation, the CAD program could be "retrofitted" to the network environment for use with the KeyServer. Each student would be authorized and encouraged to duplicate the application freely. A publisher might be interested simply in maximizing the number of students exposed to their product, without giving up control over usage, or a publisher might request usage statistics that would fulfill the terms of a network license and provide accurate grounds for establishing realistic fees.

Software residing on a user's local disk can be "turned on" or "turned off" from the central KeyServer, which provides a means of supporting a short-term, course-specific requirement and provides a mechanism for disabling old software versions when "bug-fix" releases become available. The user can be informed of the status of each application by an automatic messaging facility built into the KeyServer. When an application is in use by the maximum number of licensed users, a new launch will be denied, and the user may request to be notified when a "launch key" becomes available.

How It Works

Originally conceived and developed by Denis Devlin, Director of Computing for Mathematics and Computer Science at Dartmouth College, the KeyServer control software concurrently regulates and monitors the use of the network-licensed software, maintaining a log of usage statistics that may serve as a basis for negotiating reasonable site-license fees with vendors.

When a user opens a network-licensed application, a "request-to-launch" is sent over the network to a central KeyServer, which logs the launch time and returns a "launch-enabling key" to the requestor. When the user quits, the key is returned automatically to the KeyServer, which logs the return time and makes the key available for another user.

The applications are identical to their individually purchased counterparts except for one detail: the network-licensed applications require a connection to the campus-wide network before they can be launched successfully. Installation and use are simple: users need to have a copy of a "Network Pass" installed in the System Folder of their startup disk, and they must be connected to the network, either directly through AppleTalk or by dialing in. With the Network Pass and the network connection in place, the use of network-licensed software is completely transparent — the client-to-KeyServer launch-request transaction is nearly instantaneous.

Vendor Negotiations

Dartmouth College has obtained conditional approval from several major commercial publishers of Macintosh applications; they have agreed to allow Dartmouth to offer software controlled by the KeyServer on an experimental basis. Negotiations are under way with other publishers, with the goal of providing a well-rounded, comprehensive "library" of software.

For more information on the technical issues, contact Denis Devlin, from the department of Mathematics & Computer Science (x2768). For help in the use of the KeyServer, contact the Consultants in Kiewit (x2999).

(This article is used with permission by Dartmouth College Computing Services.)

Computer News Services

One reason the computer has become so popular is the amount of information that a person has access to. Here in the library we are all familiar with the use of the data available through the Online Catalog. However, often we want to talk to someone to get the information we need. A book may not have enough information on a particular topic, or it may be out of date. For instance, if you were planning to take a trip to Japan, you would most likely be able to find a book or magazine article that had most of what you wanted to know. However, you would be able to gather much more specific information if you were able to talk to someone who had been there recently, or perhaps even lives there now. If it were important enough to you, you might send out a message to all library personnel (via BlitzMail) asking if anyone had been to Japan recently. Something similar to this happened recently. A reference librarian needed to know the source of a quote. The information could not be found in the standard reference materials. Since this was rather important, the reference librarian sent a message to library personnel asking if they knew the source of the quote. Reaching many people easily is the main concept behind computer news. You will also find other people who are interested in the same topic.

Here at Dartmouth there are two methods used to be a part of computer news. The format is different for each. The first method is a bit complicated to start, but in the end is much more convenient to use. The second method uses BlitzMail.

The first involves getting access to a computer at Kiewit (access is available to all Dartmouth employees — the name of the machine is "eleazar"; you will get information on how to log on when you sign up at the Kiewit Consultants' office). When you log on you simply type "rn" (for "read news"). You are then presented with a list of available "newsgroups." A newsgroup is sort of like a section of a newspaper—a way of dividing the information into useful chunks. There are newsgroups for just about everything. If you wanted some information about travel, you might look in the newsgroup "rec.travel" ("recreation.travel"). If you were interested in skydiving, you might look in the newsgroup that deals with skydiving ("rec.skydiving"). There all sorts of newsgroups, from The Grateful Dead to education to consumer information. Of course there are many newsgroups involving computers, including the Macintosh. You only read the newsgroups that you are interested in, just like the sections of the newspaper.

Each newsgroup is composed of articles, similar to a single story in the newspaper. A major difference, though, is that anyone can submit an article to computer news whereas only reporters can write for a newspaper.

People all over the world look at these newsgroups and if they have information to contribute, they submit an article. If you are seeking information, you can write an article and submit it (very similar to sending out a BlitzMail message asking for some information). If someone knows the answer to your question, they will get back to you. Basically you are reaching many more people than just the Dartmouth community. With people all over the world reading your message it is very possible that you could talk to someone (via BlitzMail messages) who lives in Japan and get the information that you want first-hand!

The basic idea of the second method of using computer news is sending a BlitzMail message to a special address. At this address is a computer that will look at what you sent, and do what you tell it to do. The address that is used often is

LISTSERV@UHUPVM1.BITNET

If you send a message that says just HELP, the computer at this address will get your message and send you back a BlitzMail message telling you what you can do. One of the things you might want to do is to join a newsgroup. These newsgroups are often different from the ones discussed above, but the idea is similar. So if you send a BlitzMail message saying

SUB BLIND-L

you would be subscribed to the newsgroup called BLIND-L. This newsgroup deals with computer use by and for the blind. Now whenever someone mails to that newsgroup, you will get a copy of that message, as will everyone subscribing to that newsgroup. Each newsgroup has an address that you mail to in order to send an article to everyone in the newsgroup. The address for the BLIND-L newsgroup is BLIND-L@UAFSYSB. When you send a BlitzMail message to that address, it will be sent to everyone who subscribes to the newsgroup (including you, if you are a subscriber). There is a listing at the Consultants' Office in Kiewit of some of the newsgroups that you can join. There are hundreds available.

This all may sound a bit complicated, but it really isn't, and with a little practice you can be talking (via BlitzMail or rn) to people all over the world and trading information back and forth. ❦

—Jim Shain

A Reminder

Your representatives on TECOR are: Debra Agnoli, Kresge; Stan Brown, Special Collections; Barbara Bushor, Catalog Maintenance & Bindery; Ron Chabot, Paddock and Acquisitions; Suzanne Cox, Reference & Selection; Lisa Ford, Feldberg; David Izzo, Dana; Hannie Wei, Original Cataloging; Julie McIntyre, Serials; Miriam Moore, Acquisitions; Joan Toland, Sherman; Irene Schlerf, Original Cataloging; Corky Scott, Librarian's Office; and Jim Shain, Automation. John Hawkins represents Computing Services. ❦

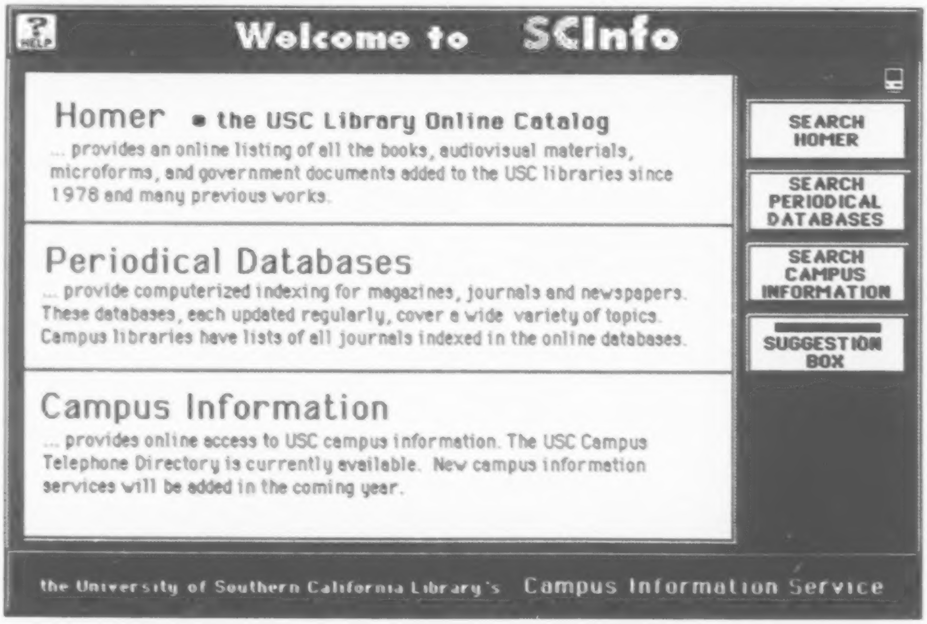
Center for Scholarly Technology
and the
University Library

University of Southern California November, 1990

USCInfo

A Development Platform for Tomorrow's Information Rich Environment

The University of Southern California Library's five year automation plan recognizes the strategic importance of the recent emergence and explosive growth in the area of online indices, information tools, and full-text databases. A growing foundation of online information resources is increasingly available today. A significant number of commercial vendors already provide these resources to campuses and other organizations for local use and direct end-user consumption. Accompanying the growth of commercially-available information resources has been a parallel explosion in the kinds and amount of public domain resources and services under development by a broad array of government agencies, non-profit organizations, and individual authors and software developers.



Homer • the USC Library Online Catalog

... provides an online listing of all the books, audiovisual materials, microforms, and government documents added to the USC libraries since 1978 and many previous works.

Periodical Databases

... provide computerized indexing for magazines, journals and newspapers. These databases, each updated regularly, cover a wide variety of topics. Campus libraries have lists of all journals indexed in the online databases.

Campus Information

... provides online access to USC campus information. The USC Campus Telephone Directory is currently available. New campus information services will be added in the coming year.

the University of Southern California Library's Campus Information Service

Much of this material is now increasingly available through various educational electronic distribution networks such as Bitnet, Internet as well as commercial distribution networks like Compuserve. In addition, there is increasing "local" activity on regional BBSs. The proposed high speed NREN will serve as a catalyst for development and delivery of yet a richer and broader array of materials serving a still larger audience of academics, researchers, commercial users, and the general public. Concurrent with national and commercial developments, at the local campus level additional information resources and technologies are being both acquired and developed in-house and made available to the campus community. Taken together, these developments help to create a "user community" that is more knowledgeable about and increasingly eager to have access to these resources and services.

USC Center for Scholarly Technology and the University Library

USC's top priority is to create a single, online information system that offers public access to a wide selection of information resources and services — in short, to provide a gateway to an "information rich" environment for students and faculty in the USC community.

We have identified the following information services and resources as key components of the online campus information system under development at USC:

- Online Catalog of library holdings, including circulation status information;
- Specialized subject area bibliographic databases, indices, and publications;
- Campus information files and services including class schedules, event calendars, service directories, etc.;
- Information about and access to resources available on both local and national networks;
- Commercially available full text resources;
- Numeric and "raw research data" stored and available only in electronic form;
- Full-text versions of public domain documents;
- Remote document request and delivery capabilities;
- Indices and guides to Image Databases;
- Image delivery.
- Knowledge management tools, including system tutorials, expert system navigational tools, data and information manipulation tools, etc.

USC, through the joint activities of the Center for Scholarly Technology, University Computing Services, and the University Library, has begun to lay the foundation for delivery of these services through *USCInfo*, the university's integrated campus information system. Launched in 1986, *USCInfo* provides members of the USC community with access to one of the largest collections of on-line information resources, accessible via a single system, available at any college or university in the United States.

To meet our goals for the future expansion and enhancement of USCInfo, our development efforts have and will continue to focus on 3 key areas:

USER INTERFACE:

USC has begun, and continues, research into and development of sophisticated, yet easy to use navigation, search/retrieval, and display interfaces. These tools must utilize new and increasingly powerful graphics and windowing capabilities now available through workstation technology.

TODAY, Library USCInfo access is provided via 126 Macintosh SE/30 workstations using the power and graphics capabilities of a HyperCard front end interface to access a large selection of library resources (online catalog and 14 periodical databases) and an initial campus information resource file.

Major expansion of campus information resource availability is planned for the summer of 91

SYSTEM ARCHITECTURE AND INFRASTRUCTURE:

USC has begun to build the appropriate local network structure and begun development of an appropriate system architecture to support a distributed, client/server based information system.

TODAY, Library USCInfo access is provided through a workstation to host based connection via standard TCP/IP protocols on a high speed FDDI campus network. This basic construction will allow us to develop access to multiple information servers via the network through a common client interface.

Connection and access to a second information host/server on the network providing a full text based service is planned for the summer of 91.

STANDARDS:

Network communication, data structure/data definition and client to server interface standards become increasingly important as we tap a broader range of information resources and serve more users on more and different systems.

Identified as a major focus point for future development efforts.

The Center for Scholarly Technology, University Computing Services and University Library at USC would like to share the results of our work with other institutions. We would like to develop mechanisms for receiving feedback on our current development efforts. USC would also welcome opportunities to discuss relevant methods for sharing and applying our work to related development efforts at other institutions.

The USCInfo HyperCard interface is available for review and testing by developers at other institutions. For more information, please contact:

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